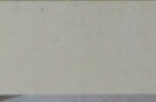


The 2009 Report Card on financing research and development for health



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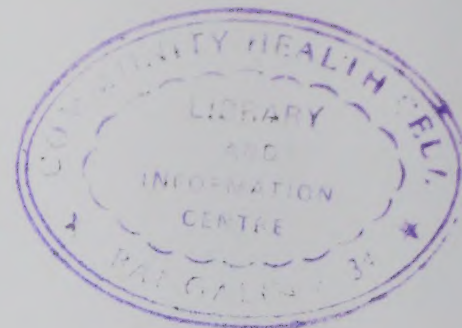
The 2009 Report Card on financing research and development for health

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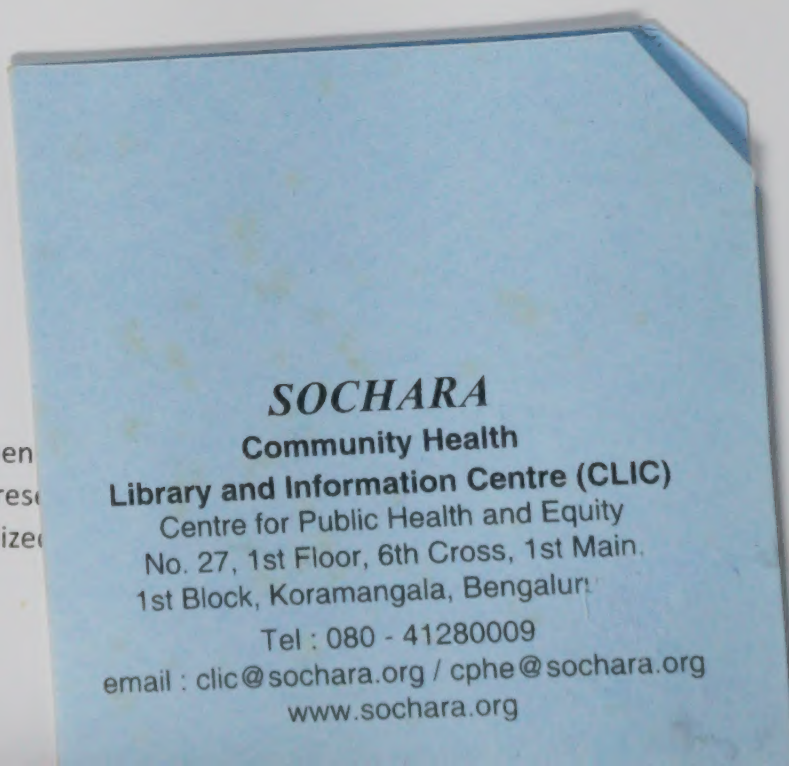
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Executive Summary

The Report Card on R&D for health tracks financial flows in the domains of development, health and research. All three domains contribute to the global financing of R&D for health, including R&D for the health needs of poor and marginalized populations in low- and middle-income countries. The Report Card examines these financial flows by comparing actual investments with targets that have been agreed internationally or proposed as benchmarks and indicators of progress.

Research for health is a matter of life and death

Enormous gains in average life expectancy were achieved during the 20th century, with many countries seeing longevity improvements of two to three decades during this period. However, average life expectancies have remained much shorter in the poorest countries and the disparities between richer and poorer countries have grown wider. Much of this health inequality results from very substantial variations in the extent to which relevant research is conducted and the results applied effectively to tackle health problems prevalent in different places.

It has been known for decades that too little research was being undertaken that focuses on health problems that are unique to, or are predominantly found in, low- and middle-income countries (LMICs). These problems include tropical infectious diseases like malaria, sleeping sickness and river blindness, for which safe and effective medicines for prevention or treatment have been lacking;

poor reproductive health, poor nutrition and inadequate access to health services, leading to very high rates of maternal and child mortality; and now burgeoning rates of noncommunicable diseases like cancer, diabetes, heart disease, stroke and mental and neurological disorders, which are adding to the mortality rates of young and middle-aged people in LMICs.

As new global challenges appear – such as threats of pandemics and the impacts of climate change on health – it is always the poorest populations that are the most vulnerable and whose needs are the last to be considered. Research to promote, protect and restore their health cannot be regarded as a luxury or left as an afterthought – for these vulnerable populations, it is literally a matter of life and death. Research creates new knowledge that translates into actions, processes and products that save lives – so in a real sense, ignorance is fatal.

Financing research and development for health

One way to measure how much research and development (R&D) for health is being undertaken is to look at its financing. The Global Forum for Health Research is the only organization that regularly tracks and reports on the global financing of health R&D, which now totals more than US\$ 160 billion per year. The Global Forum's analysis shows that finances for R&D relevant to the health problems predominantly found in LMICs flow from three major domains: from the overall field of research, from the health sector and from the development

assistance provided to the LMICs by high-income countries (HICs).

Targets, commitments and accountability

Over time, many countries and regions have proposed targets aimed at increasing support for development and health in general and for research and health research in particular. In some cases, the targets have acquired the status of firm commitments, while in other cases they have remained aspirations. For example:

- The UN set a target in 1970 that HICs should contribute 0.7% of their Gross National Income (GNI) to development assistance for LMICs and firm commitments to this have been reiterated by world leaders, including in the present decade at the 2002 Monterrey Conference on Financing for Development and at the 2005 G8 Summit in Gleneagles.
- In 1990, the Commission on Health Research for Development recommended that LMICs should devote the equivalent of 2% of the government health budget to health research. Commitments by countries to reach this target were made by Health Ministers meeting in Accra in 2006 and in the 2008 Global Ministerial Forum on Research for Health in Bamako.
- The Commission also recommended that development assistance agencies should also devote 5% of their health assistance to research, but no firm commitments to reaching this target have ever been made.

In fact, little is known about whether countries are achieving the targets. One of the key messages from the 2008 Global Ministerial Forum on Research for Health

in Bamako was the need for a greater sense of accountability for health research globally. This means greater transparency and a need for countries to review and assess regularly their progress. If all the targets were met, there would be billions of dollars of additional investment every year in overall development assistance and in support for health and R&D for health in LMICs.

This 2009 Report Card is an important step towards achieving transparency in research and the only publication of its kind to report on countries' performances in reaching targets related to R&D for health.

Overview of the Report Card

In the 2009 Report Card, the Global Forum for Health Research reviews the different targets set by countries at an international level, and tracks the performances of those countries in relation to their targets. This report is updated on an annual basis. Despite the challenges presented by attempting to monitor and report on progress, the report has used all available authoritative data from a number of sources to provide a comprehensive analysis of performances in three main areas: development cooperation, health and research. All three areas contribute to the global financing of R&D for health. The Report Card covers targets for research and development (R&D) in all countries, looks at overseas development assistance investments by high-income countries, considers targets for investments in health, in R&D in general and health R&D in particular in LMIC countries and also looks at targets for the global health initiatives and development agencies.

Some Key Findings

Official Development Assistance (ODA)

Targets:

- In 1970 the UN General Assembly agreed that each HIC would progressively increase its ODA to reach a minimum of 0.7% of GNI by the middle of the decade.
- The 2005 G8 Gleneagles Summit reported that the European Union (EU) had pledged to reach 0.7% ODA/GNI by 2015, with a new interim collective target of 0.56% ODA/GNI by 2010. The EU would nearly double its ODA between 2004 and 2010 from € 34.5 billion to € 67 billion. ODA from the G8 and other donors to all LMICs would increase by around US\$50 billion a year by 2010, compared to 2004, with US\$25 billion a year of this going to Africa.

Findings:

- Out of 26 HICs that reported, only five countries have met the UN target set in 1970 for all HICs to allocate 0.7% of GNI to ODA. The remaining 21 need to increase their combined ODA by US\$ 268.61 billion, compared to 2008, to reach the UN target. The USA, while being largest economy in the world, contributes one of the smallest shares of its GNI to ODA of any HIC (0.18% in 2008).
- In 2004, the G7 collectively committed US\$ 57.6 billion to ODA and by 2008 this had risen to US\$ 80.8 billion, which represents an increase of US\$ 23.2 billion (or 46% towards the attainment of the goal).
- Excluding debt relief grants, underlying ODA to Africa rose

by 12% in real terms from 2004 to 2006. In 2007, net ODA to Africa amounted to US\$ 38.7 billion. For the G8 promise to Africa to be fulfilled, ODA to Africa would need to be at least \$54.5 billion in 2010, at 2004 prices and exchange rates. To achieve this target, donors will need to boost their aid to Africa between 2007 and 2010 by over 17% annually.

Health

Targets:

In their 2001 Abuja Declaration, countries of the Organization of African Unity (AU) set a target of allocating at least 15% of their annual government budgets to the health sector. This regional target also provides a benchmark for assessing the degree of government support for health in LMICs generally.

Findings:

- By 2006, six members of the AU (Botswana, Burkina Faso, Malawi, Niger, Rwanda and Zambia) had met the 15% commitment, while five countries (Burundi, Cote d'Ivoire, Ghana, Guinea-Bissau and Nigeria) were still spending less than 5% of their government budgets on health. In over a third of AU countries, the fraction of government spending on health actually decreased between 2000 and 2006.
- In the Latin American and Caribbean region, five countries (Colombia, Costa Rica, El Salvador, Haiti and Nicaragua) were investing 15% or more of government spending in health by 2006; while Guinea and Jamaica were investing less than 5%.
- In the Asia-Pacific region, government

expenditure on health in 2006 was 15% or more of total government expenditure for the Federated States of Micronesia, Nauru, Timor-Leste and Tuvalu, while it was less than 5% for India, Iraq, Lao PDR, Myanmar and Pakistan.

General R&D

Targets:

- In 2002 the EU agreed that overall spending on R&D and innovation in the EU should be increased with the aim of approaching 3% of GDP by 2010, up from 1.9% in 2000. In 2009, President Obama set a target of raising US investment in R&D from its level of 2.66% in 2006 to more than 3%.
- In 2003, AU countries reaffirmed their commitment to increasing public spending on R&D to at least 1% of GDP within five years. This regional target also provides a benchmark for assessing the degree of support for R&D in LMICs generally.

Findings:

- Compared with 2006, overall the EU needs to invest a further US\$ 157.9 billion in R&D to achieve the 3% of GDP target for 2010. Most EU countries – with the exception of Finland and Sweden – need to increase the proportion of GDP they spend on R&D if they are individually to meet the overall EU 3% target by 2010. For Austria, Denmark, France and Germany this would require an additional investment of 0.5-1.0 % of GDP in R&D from their 2006 levels, while for the other EU countries increases of more than 1.0 % would be required.
- Within the African Union, only

South Africa regularly tracks and reports its R&D investments, which had risen to 0.95% of GDP by 2007.

- The BRICSA (Brazil, Russian Federation, India, China and South Africa) countries are becoming key drivers of innovation among LMICs. China has made the largest investments in R&D as a proportion of GDP (1.42% in 2006 and 1.49% in 2007) and has also shown the greatest rate of increase in R&D in recent years, whereas India lags behind the group with only 0.71% (2004 – most recent data available).

R&D for health

Targets:

- There is no formal target for investments in R&D for health as a percentage of GDP. However the Global Strategy and Plan of Action (GSPoA) on Public Health, Innovation and Intellectual Property, which was agreed in 2008 by inter-governmental negotiations, estimated that implementing the Plan would require US\$ 147 billion over seven years (2009-2015) or roughly US\$ 16 billion more per year, in addition to the roughly US\$ 5 billion per year currently invested in health problems of LMICs.
- In 1990, the Commission on Health Research for Development recommended that LMICs should devote the equivalent of 2% of the government health budget to health research and that 5% of ODA to health should be also be allocated to health research and capacity strengthening.

Findings:

- Several countries (Denmark, Iceland, Sweden, Switzerland, UK and USA)

invested 0.5% or more of GDP in R&D for health in 2005. If the other large economies with 2005 GDPs of US\$ 1 trillion or more were to increase their investments in R&D for health to 0.5% of their 2005 GDP, this would raise the net annual level of financing for R&D for health by US\$ 23 billion and a significant fraction of this increase could be devoted to problems relevant to the health needs of LMICs as defined in the GSPoA.

- Within the BRICSA group, according to OECD data, South Africa was making the biggest investment in health R&D, as a proportion of health spending in 2005, at just over 1.5%, while Brazil, China, India and the Russian Federation were all investing well below 1%.
- In Latin America and the Caribbean, Cuba, Panama and Venezuela were making the largest investments in health R&D as a proportion of health spending in 2005, but none reached even 1.5%. Data for other LMICs is almost non-existent.
- Development assistance for health (measured in real 2007 US dollars) quadrupled from US\$ 5.6 billion in 1990 to US\$ 21.8 billion in 2007, with the most dramatic gains occurring in the period 2002-2007. About 2.9% of this funding went into health research in 2006: if this proportion were raised to reach the 5% target, at least US\$ 0.5 billion more per year would be available for financing for health R&D and research capacity strengthening in LMICs.

Challenges in tracking resources

Tracking and monitoring health research investments and internationally agreed

targets is difficult and time-consuming. There are a number of challenges which need to be overcome. For example:

- There is a lack of internationally standardized methods for defining health R&D and for measuring investments in it.
- Data is often missing or incomplete.
- Inconsistent information is published.
- Most countries are ill-equipped to monitor investments in health R&D: in particular, many LMICs need to institute national systems for tracking and reporting on health R&D investments.

Health R&D resources in a changing world

Since the 2008 Report Card was published, a substantial amount of new data has become available relating to financial flows in the domains of development, health and research. Owing to variations in collecting and reporting cycles, the data available relating to the 10 elements of the Report Card covers different years in the period 2005-2008. Year on year, the Report Card therefore provides both a snapshot of the most recent information and a picture of the evolving situation over time. It represents a mechanism by which progress can be assessed and the commitments or aspirations of different actors compared with their actual performance.

Globally, investments in the areas of development, health and research have risen significantly over the past few years but few countries are meeting their targets and improvements are at a slow pace. However it is encouraging to note that some of the emerging economies

such as China and Brazil are developing their innovation capacities and invest in health R&D at levels comparable with those of some HICs.

The period 2008-2009 has seen enormous challenges being recognized and unprecedented changes taking place in the world. Assessments of progress at the mid-point towards the 2015 MDG targets have revealed that the health goals are among the least likely to be attained, especially in sub-Saharan Africa. As the greatest global financial crisis since the 1930s has unfolded, there have been many calls for investments in development generally and health in particular to be sustained and for research to be supported strongly as a vital component of protecting health and ensuring the most efficient use of current and future health resources. A series of massive mergers and acquisitions in the pharmaceutical industry has been accompanied by a growing recognition of the need for new models that will drive innovation generally and also address the health needs of poorer countries.

Policy responses: Strengthening research to address health inequities

The 2009 Report Card reveals a mixed picture of performance globally in relation to financial flows in the domains contributing to R&D for health and especially those areas of importance for health in LMICs:

- Globally, investments in the domains of development, health and research have been rising significantly in recent years, but few countries are meeting the targets that have been set and the pace of increases is often too slow.

- Relatively few countries have instituted policies and strategies for achieving the targets.
- Systems for regularly tracking and reporting on financial flows in the domains of development, health and research are often weak or non-existent – especially in LMICs but also in some major development partners including bilateral and multilateral development agencies and global health initiatives.

Health is a fundamental human right, but continuing large health disparities between and within populations across the world demonstrate the limited extent to which the protection of this human right has been given priority. Research has vital roles to play in supporting the achievement of health equity, including through identifying the nature, extent and root causes of ill-health, identifying and testing solutions and monitoring and evaluating the effectiveness and impact of interventions. Ignorance – the lack of the knowledge, products and tools that research provides – is truly a fatal disease.

Tracking resources for R&D for health provides one important approach to examining the extent of efforts being undertaken to improve health and health equity. The Global Forum for Health Research will continue its efforts to monitor the flows of resources that feed into R&D. It will especially focus attention on the gaps in resources needed to support research to address the priority health needs of the poorest and least advantaged people in the world and to ensure that they do not remain the victims of ignorance.

1 Introduction

Evidence over the past two decades has reinforced the conclusions of the Commission on Health Research for Development (1990) that more research is urgently needed to address the health problems of low- and middle-income countries (LMICs) – research that especially focuses on the poor, marginalized and disadvantaged. At present, the resources for this research come from three domains:

- Research for health is located in the broader domain of research of all kinds, receiving financing through a combination of public and private channels that operate within and across countries.
- Research also receives some of its resources directly from the health sector, through national allocations made within health sector budgets and within international health initiatives.
- Development assistance also contributes to funding of research for health, either explicitly through direct funding of health research and research capacity building or as an included component of funding for the overall health sector.

Box 1 Report Card for research and development (R&D) for health

A All countries

- A1 National R&D total investment as a percentage of GDP
- A2 National R&D for health as a percentage of GDP
- A3 National R&D for health as a percentage of national health investments
- A4 National R&D for health as a percentage of total R&D

B High-income countries

- B1 Gap between actual ODA investments and commitment to invest 0.7% of GNI on ODA
- B2 Gap between actual annual increase in ODA and commitment to double aid between 2005 and 2010 – an extra US\$ 50 billion worldwide and US\$ 25 billion for Africa
- B3 Gap between actual ODA investments in R&D for health and target to invest 5% of health ODA in R&D for health

C Low- and middle-income countries

- C1 Gap between actual investments in health and target to spend 15% of domestic public spending on health
- C2 Gap between actual investments in R&D for health and target to spend 2% of national health budgets on health research

D Global health initiatives and development agencies

- D1 Gap between actual investments and commitment to invest 5% of overall health investment portfolios of global health initiatives and development agencies to support research capacity of countries, dissemination of research findings, and management of knowledge.

Note: GDP = gross domestic product; GNI = gross national income; ODA = official development aid.

In 2008, the Global Forum for Health Research began publication of an annual Report Card, selecting 10 indicators or elements grouped in four clusters (Box 1) to track progress towards the goal of ensuring adequate attention to research for the health of the poor, marginalized and disadvantaged (Burke & Matlin, 2008).

The extent to which the relevant actors have made firm and time-bound financial commitments concerning each of these indicators is extremely variable. In some cases, there are clear and precise commitments to specific targets, while in others the targets may have little more status than being aspirations (sometimes aspirations for what the actors themselves should do; in other cases aspirations of

one group of actors for what they would like another group to do).

In some cases, the Report Card applies targets to countries that have not necessarily agreed to them. This exercise is nonetheless productive, since it provides a valid benchmark to compare countries within regions and with similar levels of development. For example, although the European Union (EU) agreed that 3% of GDP should be allocated to R&D, this target has most recently been adopted by the new US administration.

The 2009 Report Card is set out below. As before, for each indicator under review the data is provided for the most recent year available.

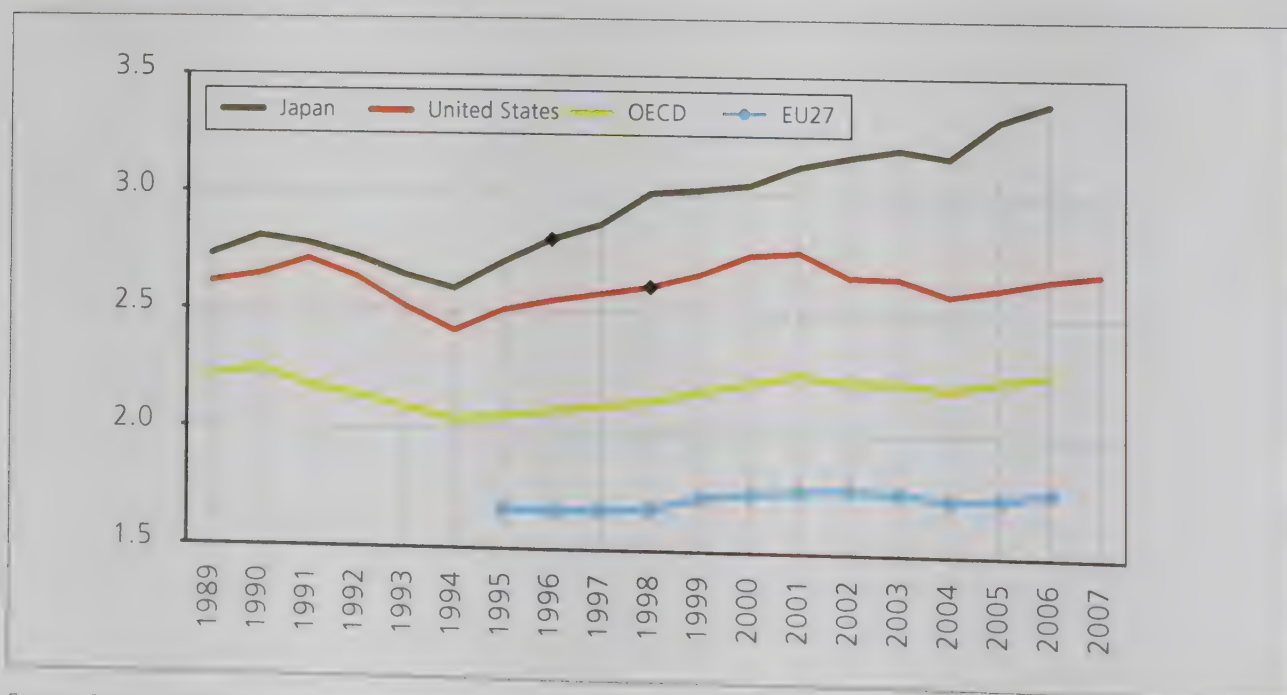
2 All countries

1 National R&D total investment as a percentage of GDP

European Union target

In 2002, the European Council agreed that **overall spending on R&D and innovation in the EU should be increased with the aim of approaching 3% of GDP by 2010, up from 1.9%**

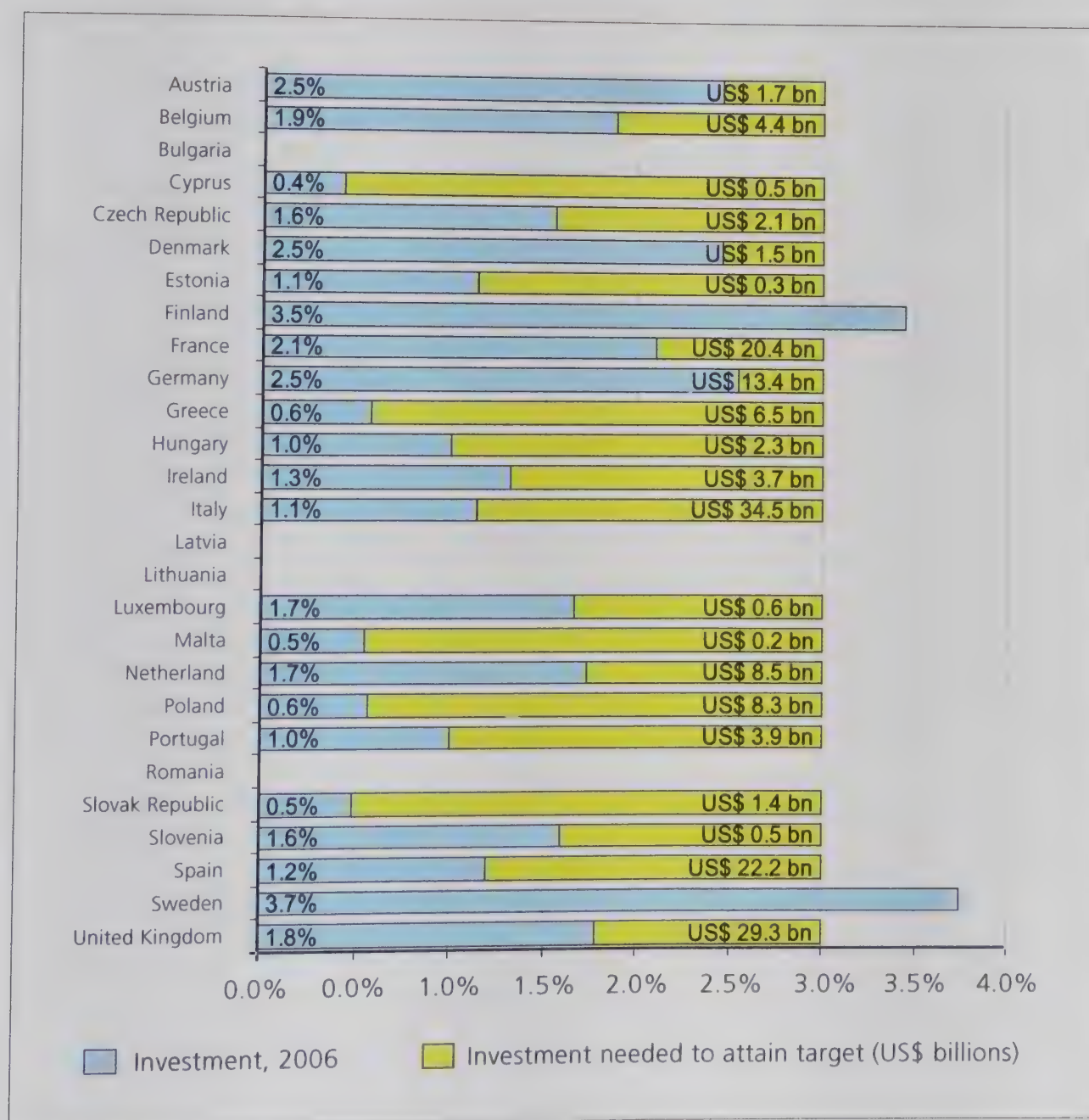
Figure 1 Gross expenditure on R&D as a percentage of GDP 1989–2007



in 2000. This is an ambitious overall target for the EU (OECD, 2008a) (Figure 1) and achieving it will require the collective effort of the member countries. It is therefore interesting to see how closely the 27 individual EU members are approaching to this target.

OECD data published in 2009 (OECD, 2009c) reports gross domestic expenditure on R&D (GERD)¹ as a percentage of GDP for 2006. Additional data was obtained from the United Nations Educational, Scientific and Cultural Organization (UNESCO)

Figure 2 Gross domestic expenditure on R&D (GERD) as a percentage of GDP by EU countries (2006)



Notes: Bulgaria, Latvia, Lithuania and Romania do not collect information on R&D investments as a per cent of GDP.

Sources:

- 1 Most data on GERD taken from OECD (2009c).
- 2 For Cyprus and Malta, UNESCO data on R&D was used, UNESCO (2009).
- 3 GDP in current US\$, 2006 from World Bank.

(2009) and the World Bank (2009). Bulgaria, Latvia, Lithuania and Romania do not collect information on R&D investments as a percentage of GDP. The expenditures by country are illustrated in Figure 2, together with the additional amounts that would need to be invested at the 2006 GDP level to reach 3%.

Compared with 2006 when the total EU-27 investment in R&D was 1.87% of GDP, if they remained at the same GDP level these countries would together need to invest a further US\$ 166.2 billion in overall R&D to achieve the 3% target for 2010.

Individually, the only two countries that have exceeded the target set by the EU are Finland and Sweden, with 3.5% and 3.7% of GDP invested in R&D, respectively. Four countries (Austria, Denmark, France and Germany) invested 2–2.5% of GDP in R&D in 2006, while 16 countries (Cyprus, Czech Republic, Estonia, Greece, Hungary, Ireland, Italy, Luxembourg, Malta, the Netherlands, Poland, Portugal, Slovak Republic, Slovenia, Spain and the United Kingdom) remain well below 2%.

Strategies to achieve the EU R&D target are particularly crucial at a time of severe economic pressure. The UK Prime Minister, Gordon Brown, said, “We will not allow science to become a victim of the recession, but rather focus on developing it as a key element of our path to recovery” (Drayson, 2009). While the UK economy was expected to contract by 3.5%, the April 2009 UK budget maintained investment in science, with an increased focus on areas expected to yield economic benefit (Wilkinson, 2009).

Other high-income countries

OECD data for 2006 also covers other, non-EU high-income countries (HICs), including OECD members and non-members (Table 1). Within this group, Israel, Japan and Korea all invest more than 3% of GDP in R&D. Recognizing the strategic economic importance of investing in R&D, in April 2009, US President Barack Obama announced that the USA will devote more than 3% of its GDP to research and development, with policies that invest in basic and applied research, create new incentives

Table 1 GERD for non-EU OECD countries and HICs (2006 or latest available year)

Country	GERD as % of GDP
Australia	2.01
Canada	1.94
Israel	4.53
Japan	3.39
Korea	3.22
Mexico	0.46 ^a
New Zealand	1.16 ^a
United States of America	2.66
OECD total	2.26

Note: ^a 2005 data

for private innovation, promote science (see Box 2). This represents breakthroughs in energy and medicine, the largest commitment to scientific and improve education in maths and research and innovation in US history.

Box 2 US President Barack Obama: The vital role of science

At such a difficult moment, there are those who say we cannot afford to invest in science, that support for research is somehow a luxury at moments defined by necessities. I fundamentally disagree. Science is more essential for our prosperity, our security, our health, our environment, and our quality of life than it has ever been before.

We are closely monitoring the emerging cases of swine flu in the United States.... But one thing is clear – our capacity to deal with a public health challenge of this sort rests heavily on the work of our scientific and medical community. And this is one more example of why we can't allow our nation to fall behind. Unfortunately, that's exactly what's happened.

So, I'm here today to set this goal: We will devote more than 3% of our GDP to research and development. We will not just meet, but we will exceed the level achieved at the height of the space race, through policies that invest in basic and applied research, create new incentives for private innovation, promote breakthroughs in energy and medicine, and improve education in math and science.

This represents the largest commitment to scientific research and innovation in American history.

The fact is an investigation into a particular physical, chemical, or biological process might not pay off for a year, or a decade, or at all. And when it does, the rewards are often broadly shared, enjoyed by those who bore its costs but also by those who did not. And that's why the private sector generally under-invests in basic science, and why the public sector must invest in this kind of research – because while the risks may be large, so are the rewards for our economy and our society.

But the renewed commitment of our nation will not be driven by government investment alone. It's a commitment that extends from the laboratory to the marketplace. And that's why my budget makes the research and experimentation tax credit permanent. This is a tax credit that returns two dollars to the economy for every dollar we spend, by helping companies afford the often high costs of developing new ideas, new technologies, and new products. Yet, at times, we've allowed it to lapse or only renewed it year to year. I've heard this time and again from entrepreneurs across this country: By making this credit permanent we make it possible for businesses to plan the kinds of projects that create jobs and economic growth.

Extracts from speech by President Barack Obama to US National Academy of Sciences, 27 April 2009 (Obama, 2009).

President Obama stressed the importance of the private sector in contributing to the national effort in R&D. Similarly, the EU target of overall expenditure of 3% of GDP on R&D is expected to include 2% investment by industry.

Policy implication

- Compared with 2006, overall the EU needs to invest a further US\$ 166.2 billion in R&D to achieve the 3% of GDP target for 2010.
- Most EU countries – with the exception of Finland and Sweden – need to increase the proportion of GDP they spend on R&D if they are individually to meet the overall EU 3% target by 2010. For Austria, Denmark, France and Germany this would require an additional investment of 0.5–1.0 % of GDP in R&D from their 2006 levels, while for the other EU countries increases

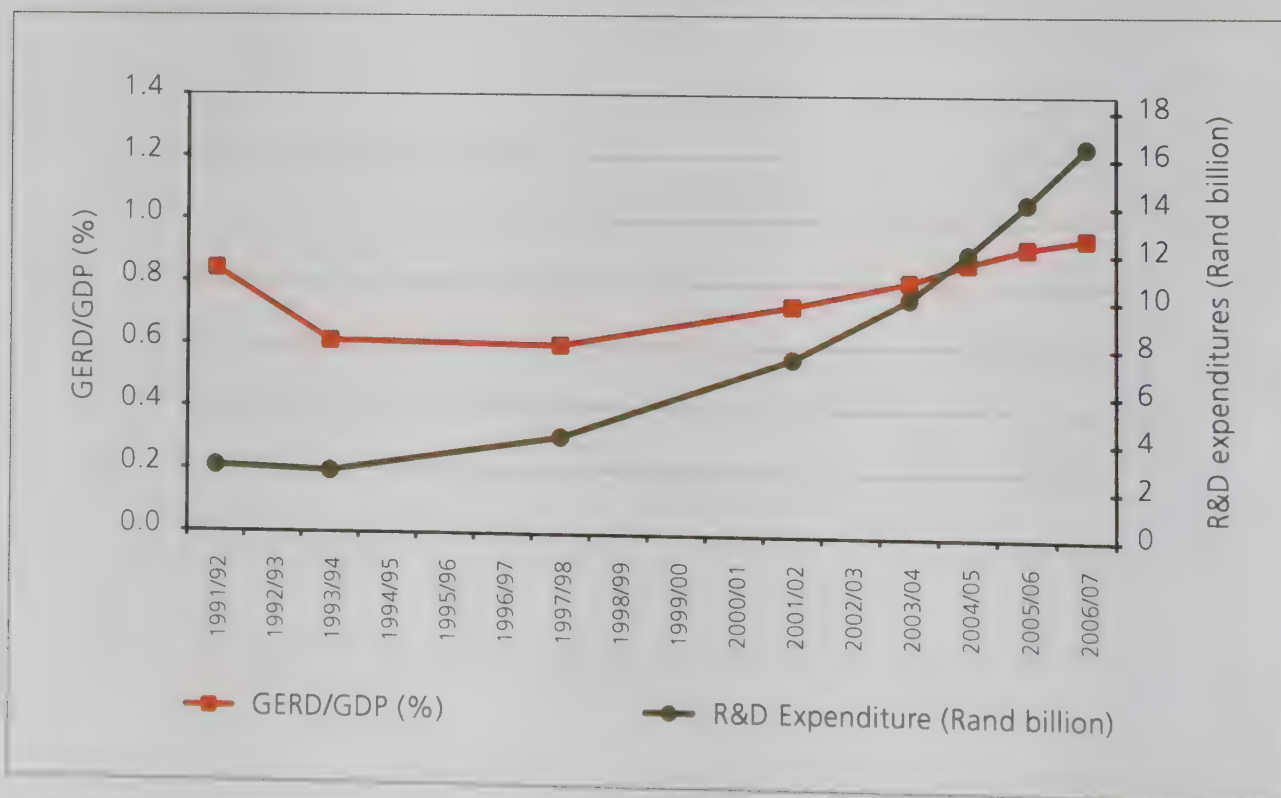
of more than 1.0 % of GDP would be required.

- Country strategies to reach the target are needed. The UK has announced a policy of strong investment in science and technology in response to the economic crisis and, beyond the EU, the USA has announced it will also devote more than 3% of its GDP to research and development – the largest commitment to scientific research and innovation in US history.

African Union target

The New Partnership for Africa's Development (NEPAD) spearheads the efforts of the African Union (AU) to improve Africa's performance across a range of development fields, including R&D. At the first NEPAD Ministerial Conference on Science and Technology in **November 2003, ministers of science and technology of 20 AU countries**

Figure 3 South African R&D investments and intensity 1991–2007



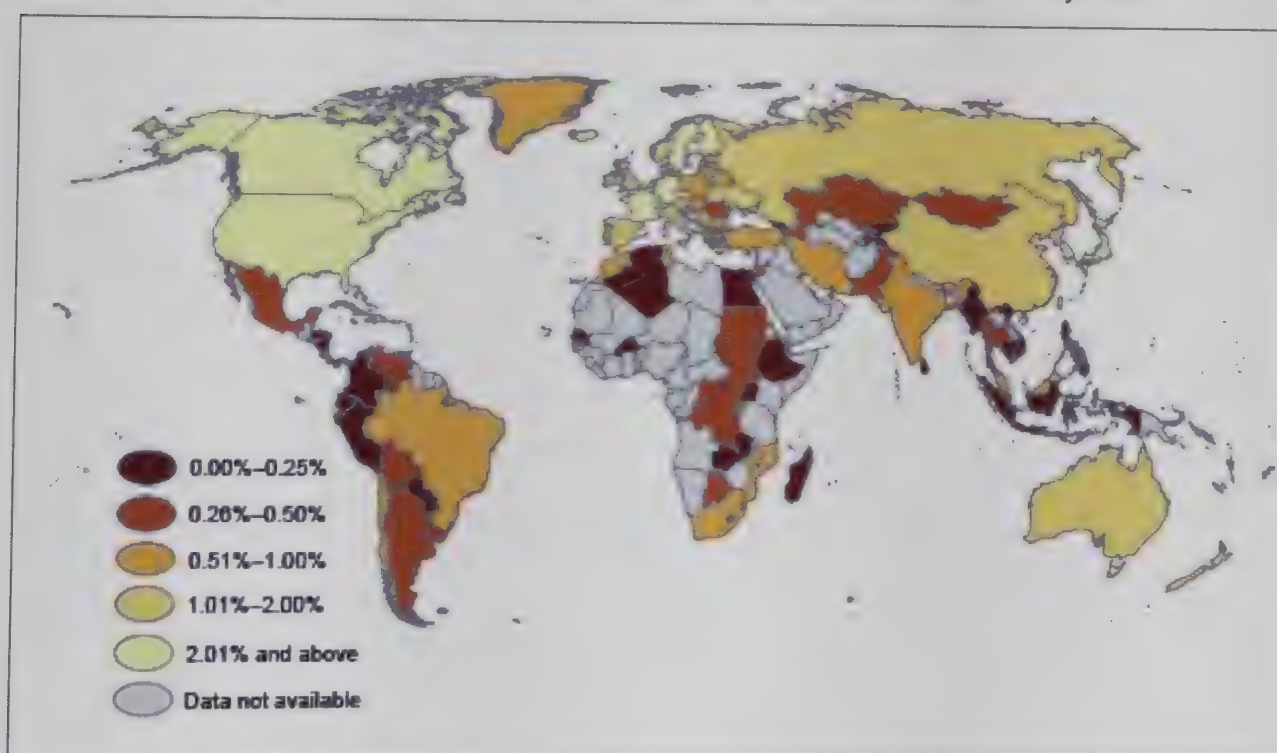
Source: NACI, 2008

reaffirmed their commitment to increasing public spending on R&D to at least 1% of GDP within five years and the AU commitment to this 1% target has been reiterated on a number of occasions.

Unfortunately, there is almost no data on R&D investments by African countries. The only country in the region that regularly tracks and reports its R&D performance is South Africa, which had reached a GERD of 0.95% of GDP by 2007 (Figure 3), albeit with 56% of this coming from the business enterprise sector (NACI, 2008).

Data on R&D investments in other African countries appears only sporadically. The Global Forum is currently supporting a pilot study with Afristat (2009) to build capacity for health research related data in francophone Africa. UNESCO has provided a snapshot of available data globally on gross expenditures on R&D as a percentage of GDP for many countries, (Figure 4), from its 2006 global survey on statistics of science and technology (Fahmi, 2009; UNESCO, 2007). It is notable how little data was obtained on countries in Africa.

Figure 4 GERD as a percentage of GDP (2005 or latest available year)



Source: Fahmi, 2009.

A survey of R&D intensity by the Organization of the Islamic Conference (OIC) in 2009 included information (“data on the most recent year available between 2000 and 2006”) on Tunisia (1.03%) and Morocco (0.66%) in North Africa, and Mozambique (0.5%) in sub-

Saharan Africa (OIC, 2009). Other countries mentioned in the OIC report included Sudan (c. 0.3%), Egypt (c. 0.2%), Uganda (c. 0.2%), Burkina Faso (c. 0.2%) and Algeria (c. <0.1%). It was also noted that, while all Burkina Faso’s R&D was government financed, most

of the R&D funding in Mozambique (63.5%) and Uganda (56.9%) actually came from abroad.

As discussed by the Global Forum in a recent review of innovation for health (Matlin, 2008), the United Nations Development Programme (UNDP) has developed a Technology Achievement Index, with indicators selected for their relevance to important technology policy objectives for all countries, regardless of their level of development. The 2001 results for 72 countries for which data were available and of acceptable quality (Figure 5) highlighted the paucity of data and the weakness of technological achievement in Africa (UNDP, 2001).

While science and innovation in much of Africa has long lagged behind other regions, new approaches are now being seen, as reflected in the Tshwane

Consensus (Science in Africa, 2005). Africa's Science and Technology Consolidated Plan of Action 2006–2010 was first elaborated in 2005 by the African Union/NEPAD and is being implemented with assistance from UNESCO. It has adopted three flagship projects: i) capacity building in science and technology (S&T) and innovation policy; ii) enhancing science and technology education; and iii) the African Virtual Campus. The plan of action acknowledges Africa's low investment in science and technology and seeks to improve policy conditions and innovation mechanisms. It notes that science, technology and innovation indicators are crucial for monitoring Africa's scientific progress and acknowledges the value of indicators such as the target of a ratio of R&D spending to GDP of 1% for African countries (AU/NEPAD, 2005).

Figure 5 Technology Achievement Index:
The geography of technological innovation and achievement



Source: UNDP, 2001

In recognition of the weakness of S&T in Africa (Pouris & Pouris 2009), the dearth of S&T indicators (UNECA, 2005), the challenges of producing reliable and internationally comparable data (Kahn, 2008), and the key importance of tracking efforts to improve the poor state of S&T in most of the continent, NEPAD has instituted the African Science, Technology and Innovation Indicators Initiative (ASTII) and the establishment of the African Observatory for Science, Technology and Innovation (AOSTI). ASTII aims at the development and adoption of

African common science, technology and innovation indicators, while AOSTI will ensure that the indicators and information gathering, as well as collation, compilation and validation are standardized (NEPAD, 2008).

Beyond these technical measures, the UN Economic Commission for Africa (ECA) has stressed the importance of policy measures and political commitment to move S&T to the centre of the development process (UNECA, 2005) (Box 3).

Box 3 Policy and political imperatives for science, technology and innovation in Africa

The new and strengthened technological regime requires strong political leadership and a better integration of science and technology and innovation policies – which are cutting across many sectors – with overall development policies, including economic, financial, budgetary, fiscal, labour, agriculture, industry, micro-enterprise development and others. This has far-reaching consequences for policy-making, as it implies that science and technology should move from the periphery to the centre of development policy processes and pervades all relevant policy areas impacting on the development and utilization of science and technology. Success in this realignment and ‘re-centring’ requires strong political commitment vis-à-vis science and technology and the full engagement of the science and technology community...

This ‘re-centring’ may be facilitated by the setting up or strengthening of Parliamentary Committees on Science and Technology (PCST) – already in existence in a few African countries – such as South Africa, Uganda, Nigeria and Kenya. It may also be facilitated by the appointment of high profile and highly credible and respected science and technology advisors to the President. The creation of Interdepartmental Science and Technology Fora (ISTF), comprising science and technology focal points of various ministries and governmental institutions dealing with issues related to science and technology may also be useful in ‘demonopolizing’ science and technology responsibilities and in bringing science and technology issues to the centre of the development policy process. ECA is encouraging the diffusion of these best practices throughout the continent.

UN Economic Commission for Africa, 2005

Policy implication

With the exception of South Africa, only sporadic and incomplete information is available on R&D intensity in African states. From the limited information available, the vast majority of AU countries are far from attaining the AU target of investing 1% of GDP in R&D. Two essential requirements need to be met urgently:

- 1 AU countries need to institute national policies and strategies to strengthen their investments in R&D.
- 2 Tracking systems, using standardized definitions and methodologies, need to be instituted and implemented to provide annual assessments of R&D intensity in each country.

In this regard, the current programmes of AU/NEPAD, UNESCO and the UN Commission for Africa have a vital role to play and should be strongly supported by AU member countries and development partners.

Other regions

In a comparative study (Satti & Nour, 2005) of S&T development indicators, it was concluded that Arab Gulf and

Mediterranean countries also lacked adequate investment in the financial and human resources necessary to promote S&T for development. As a consequence, they have lagged behind the rapidly advancing Asian countries in terms of S&T input and output indicators. In both regions most R&D and S&T activities are allocated within the public and university sectors, with very small contribution from the private sector.

The 2009 OIC report surveying R&D intensity in member states of the Organization of the Islamic Conference cited a number of non-African countries, including Azerbaijan, Brunei, Indonesia, Jordan, Kazakhstan, Kuwait, Kyrgyz Republic, Pakistan and Tajikistan, as all having R&D investments well below the OIC average of 0.47% of GDP, Brunei (0.02%) being the lowest of all.

The BRICSA group of countries (Brazil, Russian Federation, India, China and South Africa) are becoming key drivers of innovation among LMICs. Within this group, China has made both the largest investments and has also shown the greatest rate of increase in R&D as a proportion of GDP in the last few years (Table 2).

Table 2 GERD for BRICSA countries

Country	GERD as % of GDP	
	2003	2006 or latest available year
Brazil	0.88	1.02
Russian Federation	1.28	1.07
India	0.74	0.71 ^a
China	1.13	1.42 (1.49) ^b
South Africa	0.80	0.95

Note: ^a 2004 data; ^b 2007 data

Source: OECD, 2009a

Table 3 Expenditure on S&T as a percentage of GDP, Latin American and Caribbean countries

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Argentina							0.42	0.42	0.41	0.45	0.44	0.42	0.39	0.41	0.44	0.46	0.49
Bolivia		0.37	0.40	0.40	0.40	0.36	0.33	0.32	0.29	0.29	0.28	0.27	0.26				
Brazil	0.78	0.88	0.76	0.91	0.92	0.87	0.72			0.94	0.96	0.91	0.88	0.83	0.97	1.02	
Chile	0.51	0.53	0.58	0.63	0.62	0.62	0.53	0.49	0.50	0.51	0.53	0.53	0.68	0.67	0.67		
Colombia						0.29	0.30	0.27	0.21	0.20	0.14	0.14	0.15	0.18	0.18	0.18	0.18
Costa Rica							0.33	0.32	0.28	0.36	0.43			0.39	0.41		
Cuba	0.70	0.68	1.13	0.78	0.55	0.47	0.38	0.43	0.54	0.50	0.45	0.53	0.53	0.54	0.56	0.51	0.41
Ecuador						0.08	0.10	0.09	0.09			0.06	0.06	0.06			0.15
El Salvador									0.08								
Guatemala								0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.05
Honduras											0.06	0.05	0.06	0.06	0.06		
Jamaica												0.05	0.07				
Mexico				0.22	0.29	0.31	0.31	0.34	0.38	0.43	0.37	0.39	0.42	0.45	0.44	0.46	
Nicaragua								0.08					0.05				
Panama	0.38	0.38	0.34	0.36	0.37	0.38	0.38	0.37	0.34	0.35	0.40	0.40	0.36	0.34	0.24	0.25	
Paraguay												0.09	0.11	0.08	0.08	0.09	
Peru								0.08	0.10	0.10	0.11	0.11	0.10	0.10	0.15		
Trinidad & Tobago							0.10	0.11	0.13	0.12	0.11	0.10	0.14	0.12	0.12	0.12	0.09
Uruguay	0.25	0.15	0.19	0.07	0.14	0.28	0.28	0.39	0.22	0.26	0.24		0.26				0.36
Latin America & Caribbean	0.53	0.53	0.48	0.50	0.55	0.58	0.51	0.52	0.55	0.55	0.55	0.54	0.53	0.54	0.53	0.60	0.63

Source: RICYT, 2009.

For the region of the Americas, trends from 1990 to 2006 have been compiled by RICyT (2009). By 2006, the Latin American and Caribbean region had reached an average R&D intensity of 0.63% of GDP, overall representing a modest increase from 0.53% in

1990 (Table 3).

The importance of a long-term perspective for developing science, technology and innovation capacity has been stressed (Peng, 2009) (Box 4).

Box 4 Taking a long-term perspective for developing science, technology and innovation capacity

"A long-term perspective can help planners think together about the future, and get away from immediate constraints. Such visionary work is rarely the basis for immediate policy."

– Geoff Oldham, former chairman of the United Nations Advisory Committee on Science and Technology for Development

China has taken such a long-term approach (Peng, 2009) with the release by the Chinese Academy of Sciences of a 50-year science strategy. This 'roadmap' for science and technology development is an extension of the Mid-to-Long-Term Plan for Development of Science and Technology (2006–2020), issued by the State Council of China, which highlights the importance of research in basic sciences and frontier technologies. The human health component projects that China will aim to transform from treating disease to preventing it. To do this it aims to combine insights from a variety of research areas including biology, environment, psychology and society.

Policy implication

The AU target of investing 1% of GDP in R&D provides a useful benchmark for assessing commitment to R&D in LMICs generally. The majority of LMICs do not assess or report their own R&D intensity, and instituting such

annual assessments is an important step to support evidence-informed policy-making – coupled, as appropriate, with the adoption of national policies and strategies for R&D investment.

Among the BRICSA group of countries, China is investing strongly in R&D and has developed a very long-term strategy for science and technology, while Brazil, the Russian Federation and South Africa are investing close to or above the level of 1% of GDP. India lags significantly behind in this group and needs to increase its R&D investment significantly from the level of 0.71% reported for 2004.

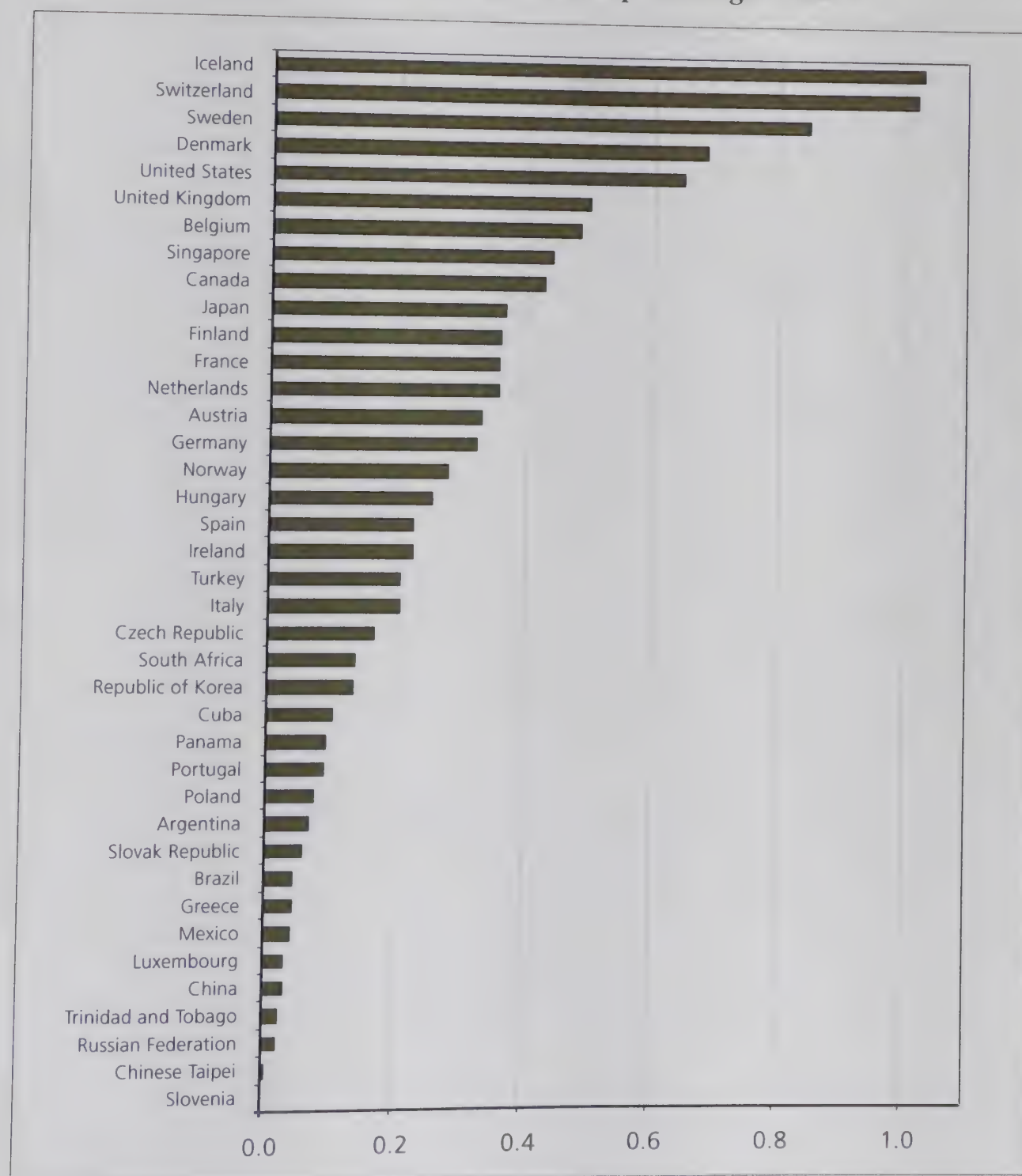
In the Latin American and Caribbean region, apart from Brazil, no country has reached the level of 1% expenditure of GDP on R&D and Cuba was the only other country that had reached the 0.5% level. Most countries in the region need to develop policies and strategies for increasing their investments in R&D.

2 National R&D for health as a percentage of GDP;

3 National R&D for health as a percentage of national health investments

The most recent (2005) data available (Global Forum, 2008) on national investments in R&D for health as a percentage of GDP is illustrated in Figure 6. There is an extremely wide variation in how much is invested, even among high-income countries.

Figure 6 **Total investments in health R&D as percentage of GDP**



Source: Global Forum, 2008.

There is no formal target for investments in R&D for health as a percentage of GDP. However, at the beginning of 2009 the Global Strategy and Plan of Action on Public Health, Innovation and Intellectual Property, which was agreed by intergovernmental negotiations (WHA, 2008), estimated that implementing the Plan would require US\$ 147 billion over the seven years between 2009 and 2015, or roughly US\$ 16 billion more per year, on average, in addition to the roughly US\$ 5 billion per year currently invested in health problems of LMICs (WHO, 2009a). As shown in Figure 6, several countries (Denmark, Iceland, Sweden, Switzerland, UK and the USA) invested 0.5% of GDP or more in R&D for health in 2005. If the other large economies with 2005 GDPs of US\$ 1 trillion or more were to increase their investments in R&D for health to 0.5% of their 2005 GDP, this would raise the net annual level of financing for R&D for health by US\$ 23 billion and a significant fraction of this increase could be devoted to problems relevant to the health needs of LMICs.

The latest (2005) data available (Global Forum, 2008) on national R&D for

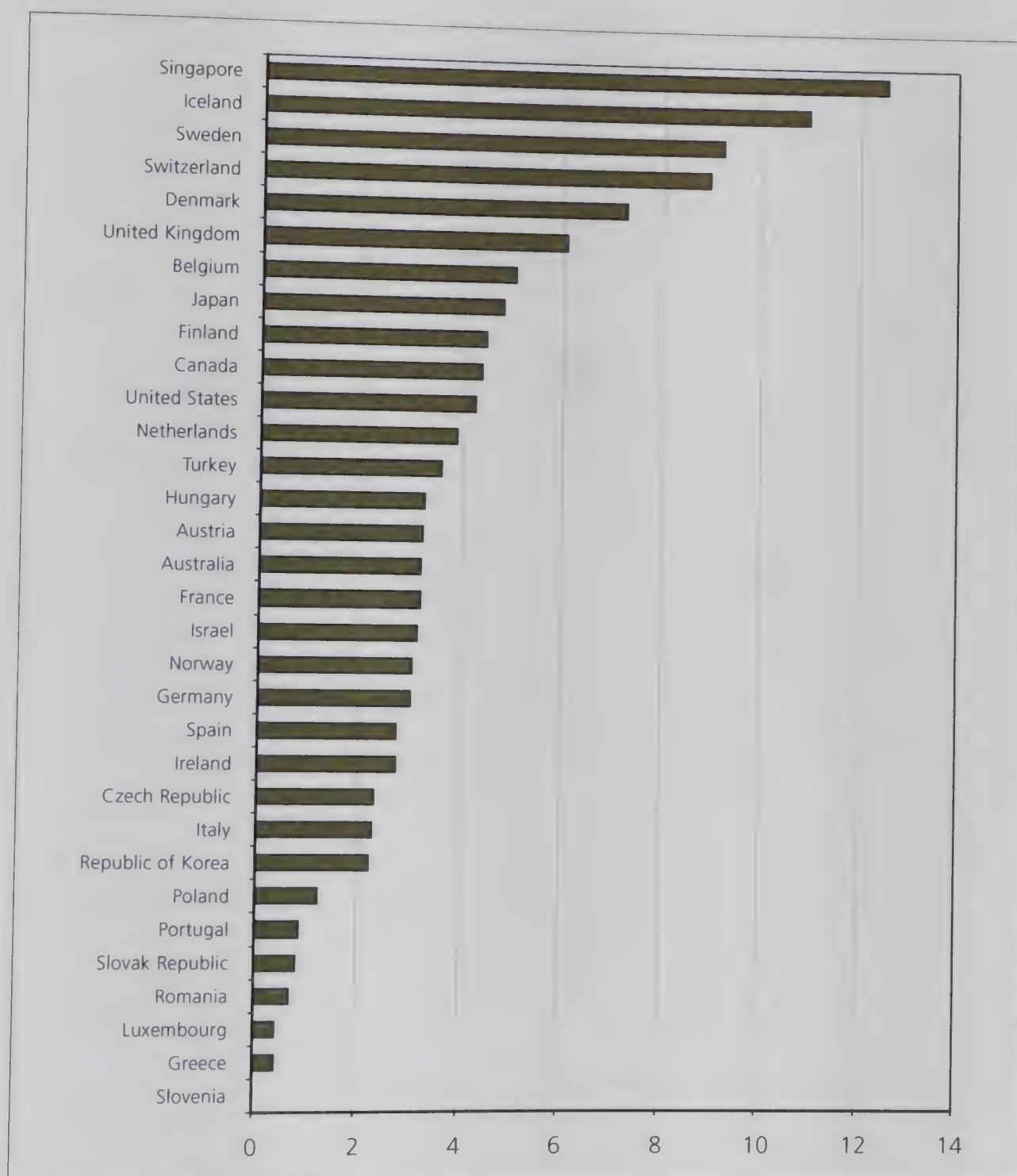
health as a percentage of national health investments is illustrated in Figure 7 for OECD countries. These countries mostly invest amounts equivalent to more than 2% of their health budgets in R&D for health, with several investing more than 4% and two (Iceland, Singapore) more than 10%.

Data on national R&D for health as a percentage of national health investments for LMICs is covered under element C2 below.

Policy implication

Investments in R&D for health are vital to improving global health and health equity. To meet the needs of financing the Global Strategy and Plan of Action on Public Health, Innovation and Intellectual Property, a greater level of global investment in R&D for health is required and a substantial portion of this could be met by high-income countries raising the proportion of their GDP devoted to R&D for health, to a level of 0.5%. This is target has already been surpassed by Denmark, Iceland, Sweden, Switzerland, the UK and the USA.

Figure 7 Total investments in health R&D as percentage of total national health investments (2005)



Source: Global Forum, 2008.

4 National R&D for health as a percentage of total R&D

There is no agreed target for this element. The latest (2005) available data on national R&D for health as a

percentage of total investments in R&D (GERD) is illustrated in Figure 8 for OECD countries, which show a wide variation from 37% for Iceland to just 2% for Luxembourg, with an average for the countries shown of 17.3%.

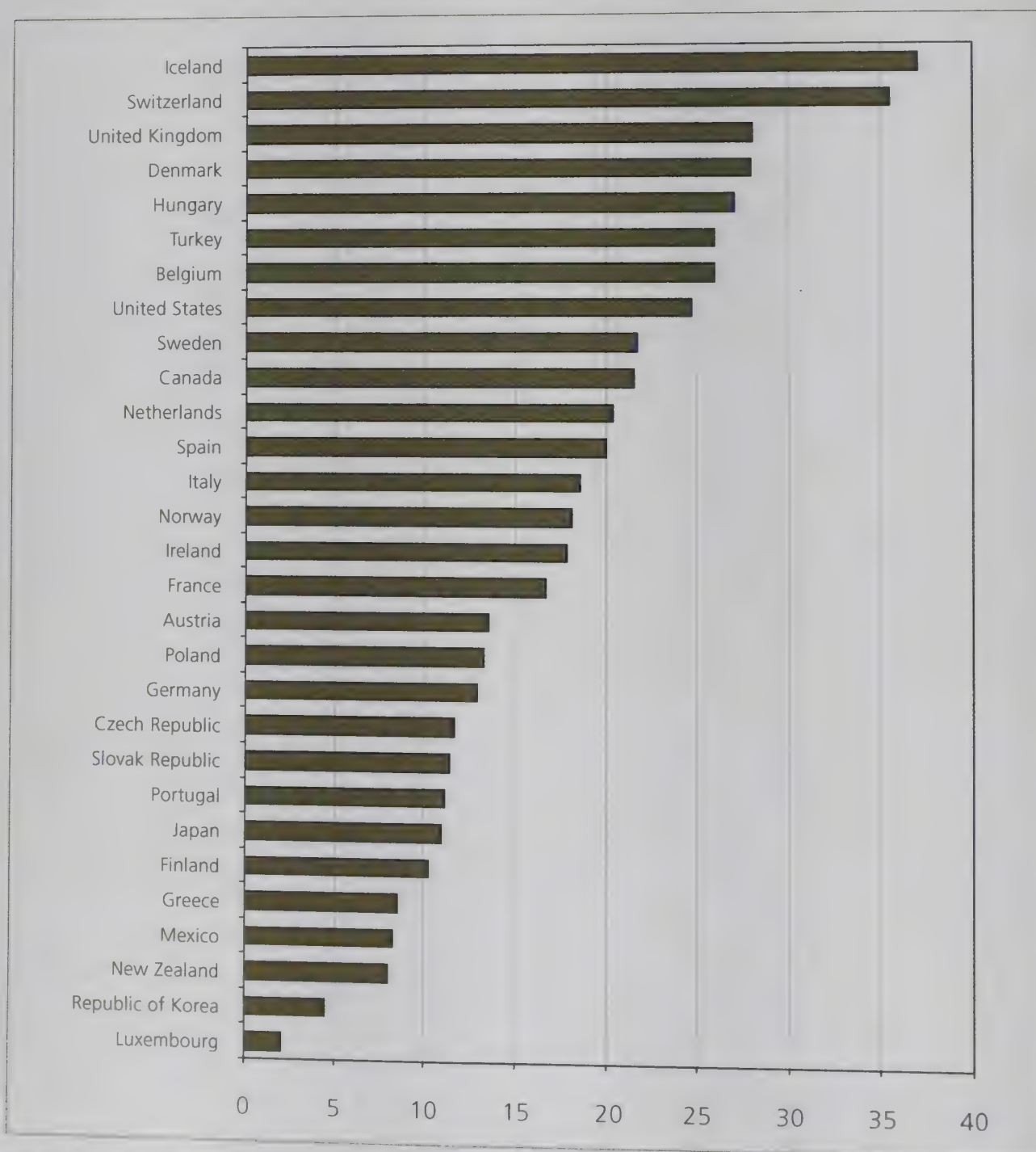
Figure 9 illustrates the percentages of total R&D invested in R&D for health in a range of non-OECD countries. Among the BRICS countries, South Africa's relative investment in health R&D (14.8%) comes closest to the average OECD level, while the other members of this group spend substantially less on health compared with R&D in other

sectors (Brazil 5.3%, India 4.3%, China 2.3%, Russian Federation 2.1%).

Policy implication

As a fundamental human right, health needs to be given a high priority in the policies of all countries, with the promotion and maintenance of good

Figure 8 National R&D for health as a percentage of total R&D: OECD countries

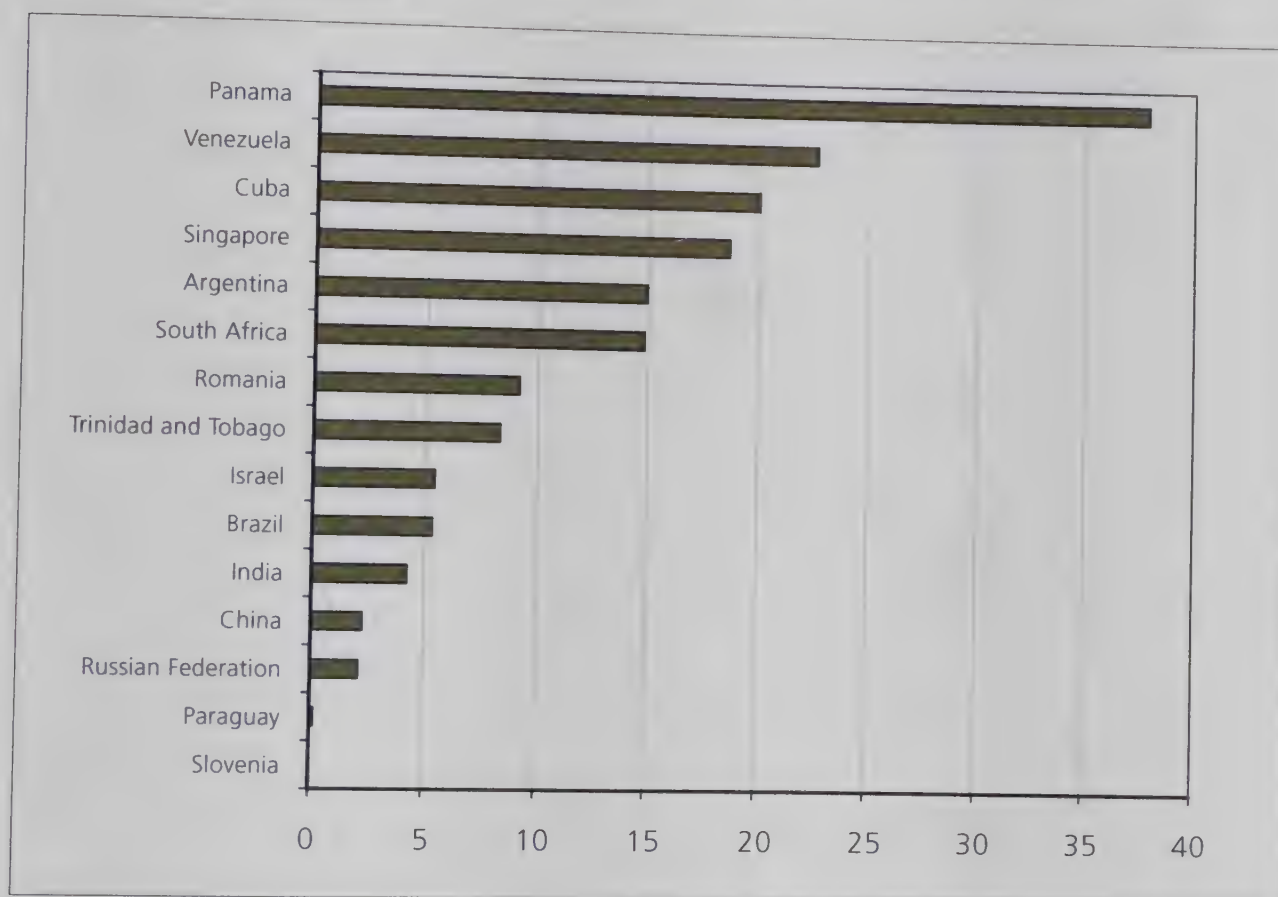


Source: Global Forum, 2008

health and health equity being supported by adequate research capacity. Financing of R&D for health in most LMICs and

some HICs needs to be increased as a proportion of overall research spending, to reflect this priority.

Figure 9 National R&D for health as a percentage of total R&D: non-OECD countries



3 High-income countries

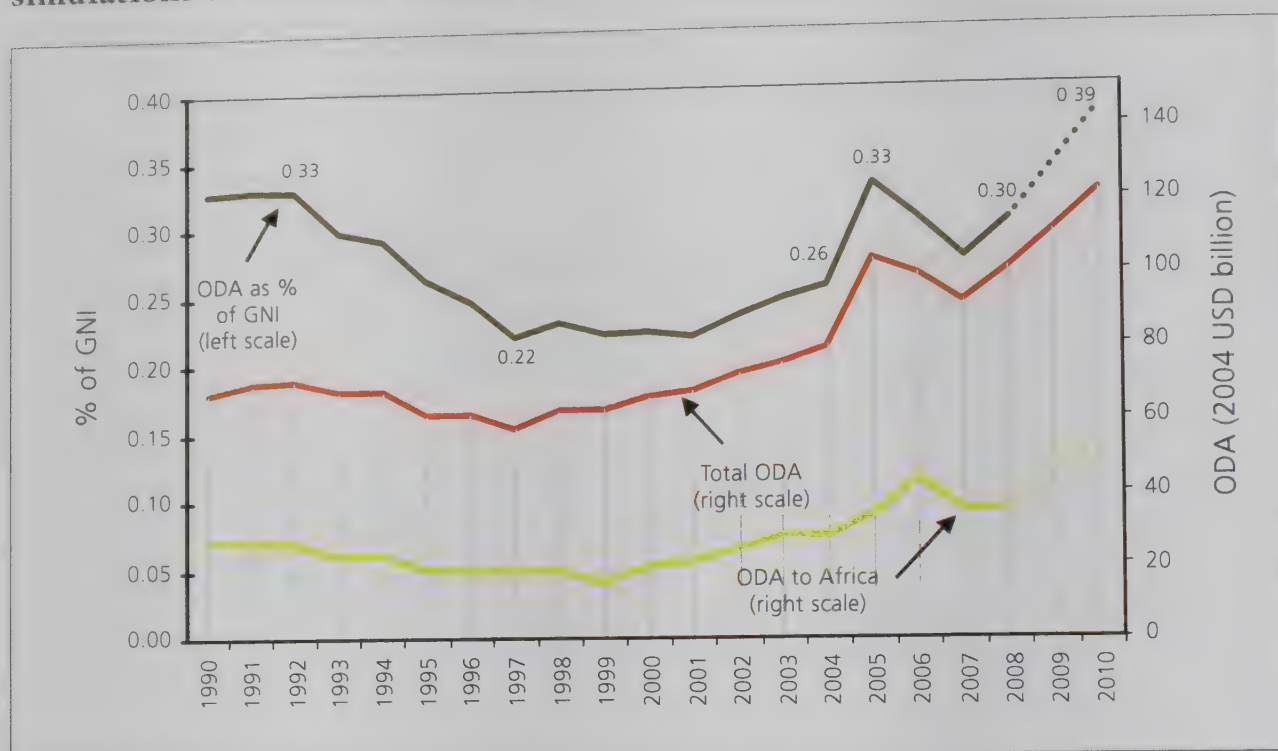
1 Gap between actual ODA investments and commitment to invest 0.7% of GNI in ODA

The UN General Assembly adopted a resolution in 1970 stating, “Each economically advanced country will progressively increase its official development assistance to the developing countries and will exert its best efforts to reach a minimum net amount of 0.7 per cent of its gross national product at market prices by the middle of the Decade”. Although only a handful of countries (notably Denmark,

Luxembourg, Netherlands, Norway and Sweden,) paid attention to this target for many years, since the 2002 Monterrey Consensus on Financing for Development many EU countries have recommitted to reaching the target not later than 2015.

After falling significantly during the 1990s, net ODA by members of the OECD Development Assistance Committee (DAC)² is still recovering towards the levels seen in the early 1990s (0.33%) and is projected to reach 0.39% in 2010 based on current commitments (OECD, 2009a) (Figure 10).

Figure 10 DAC members' net ODA 1990–2008 and DAC Secretariat simulations of net ODA to 2009 and 2010

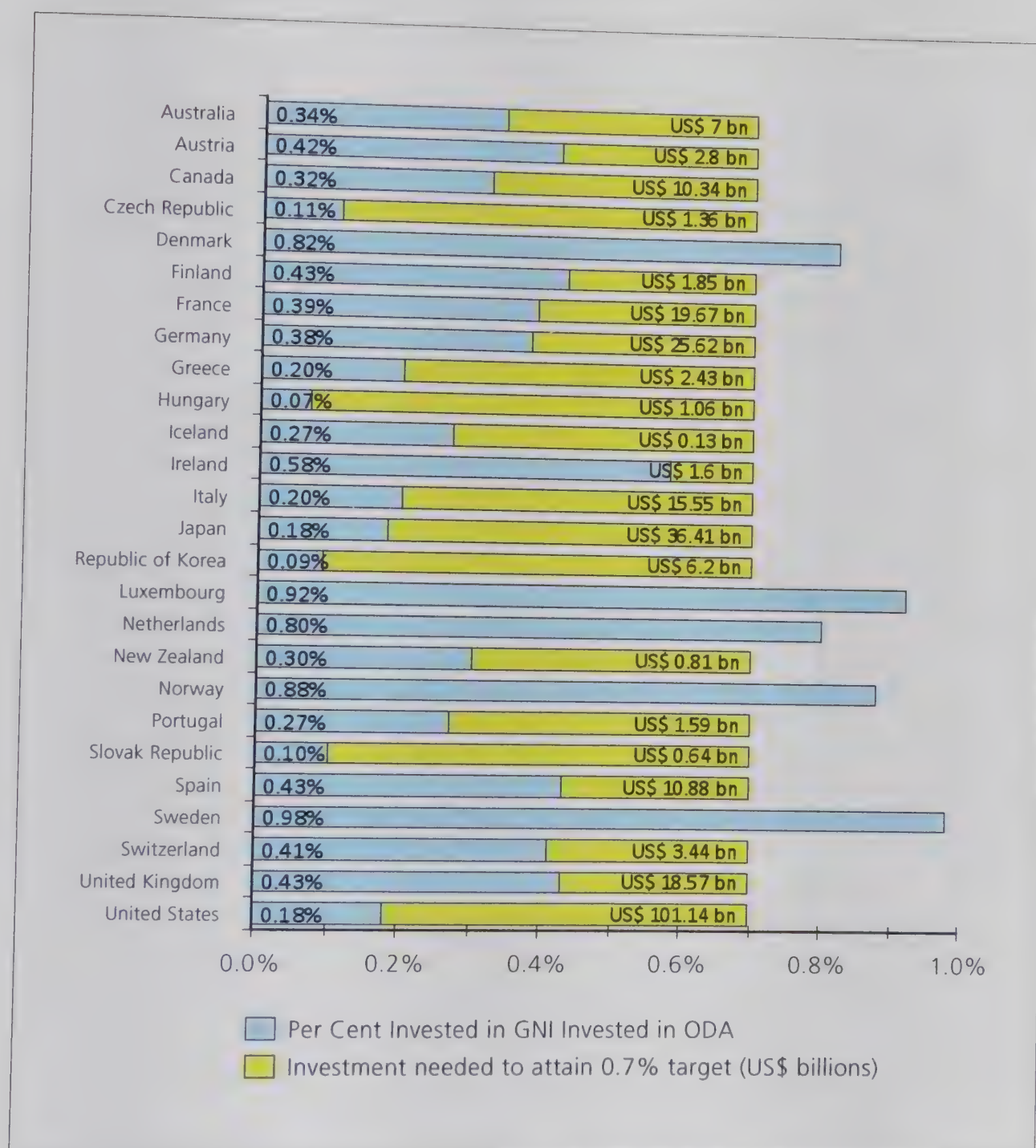


Source: OECD, 2009a.

In 2008, the World Bank's classification³ of 'high-income countries' (those having a 2008 GNI per capita of US\$ 11 906 or greater) included 66 countries. OECD data for 2008 ODA investments (OECDb, 2008) is available for only

26 countries⁴ (Figure 11). Only five of these countries have so far met the 0.7% UN target and the remaining countries illustrated would need to increase their combined ODA by US\$ 268.61 billion to reach the target.

Figure 11 Percentage of GNI invested in ODA by high-income countries (2008)



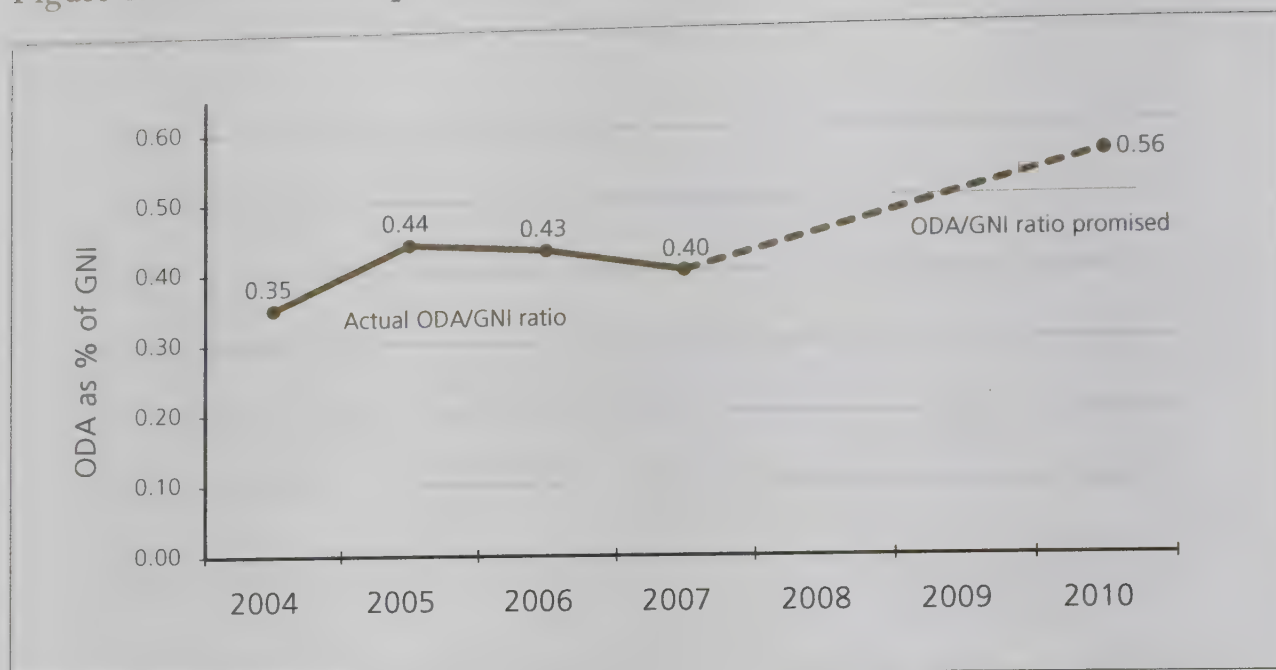
Note: 2007 data was used for Iceland.

Source: OECD, 2008b.

The G8 Gleneagles Summit reported: “The EU has pledged to reach 0.7 per cent ODA/GNI by 2015 with a new interim collective target of 0.56 per cent ODA/GNI by 2010. The EU will nearly double its ODA between 2004

and 2010 from € 34.5 billion to € 67 billion”. OECD data on the extent to which the EU had progressed towards these targets by the end of 2007 is shown in Figure 11 (OECD, 2008).

Figure 12 EU ODA as a percentage of GNI



Source: OECD, *Aid targets slipping out of reach?*

The financial crisis and ODA

Against the background of widely articulated fears of cutbacks, early responses to the 2008 financial crisis by some donors provided a mixed picture. For example:

- Ireland, which had aimed to increase its ODA to 0.6 % of GNI by 2010 and to 0.7% by 2012, made a series of cuts over a 10-month period from July 2008 which amounted to an overall reduction of 22% (€255 million) in its 2009 ODA budget (Concern, 2009).
- Italy announced in Dec 2008 that the 2009 ODA budget would be cut by 56% (AidWatch, 2009).
- Latvia, one of the newest contributors to ODA, announced in Jan 2009 that the year's ODA budget was being cut by 100% (Concern, 2009).
- Norway is continuing to increase its ODA, which will reach 1% of GNI in 2009 (NORAD, 2009).

- The UK's ODA will also continue to rise in 2009 (DFID, 2009).
- The new Obama administration in the USA announced its intention to double its foreign assistance by 2015 (US Department of Statistics, 2009).
- Despite the fact that its asset value decreased by 20% in 2008, the Bill and Melinda Gates Foundation announced that it would increase its spending from US\$ 3.3 billion in 2008 to US\$ 3.8 billion (7% of assets) in 2009 (BMGF, 2009).

A further, complicating factor is that major shifts have been occurring in exchange rates of many currencies since the financial crisis began, sometimes adversely impacting on the value of ODA contributions. For example, the value of the British pound fell significantly against the US dollar during 2008.

At a high-level meeting in Paris on 27–28 May 2009, DAC and non-DAC

OECD donors adopted an Action Plan “in response to the development challenges raised by the global economic and financial crisis”. The Action Plan was intended to feed into other major international forums, such as the OECD Ministerial Council Meeting, G8 Summit, UN Conference on the World Financial and Economic Crisis, the G20 Summit and the UN General Assembly (OECD, 2009b). While reaffirming existing ODA commitments, especially for Africa, the Action Plan recognized that the wide range of policies being deployed by development partners in response to the crisis would have major development impact. The Action Plan therefore stressed the need for:

- integrating crisis management with long-term growth and the MDGs;
- embedding the Paris Declaration and the Accra Agenda for Action into the crisis response;
- signalling greater predictability in the international response;
- ensuring complementarity between ODA and other development flows;
- monitoring and accounting for responses to the crisis.

Policy implication

To reach the ODA targets to which they have made commitments, the G8, the EU and other DAC member countries need to increase their ODA substantially during the next few years, collectively contributing an additional US\$ 268.61 billion per year if they are to reach the UN 0.7% target.

2 Gap between actual annual increase in ODA and commitment to double aid between 2005 and 2010 – an extra US\$ 50 billion worldwide and US\$ 25 billion for Africa

Paragraph 28 of the G8 Gleneagles Summit Statement on Africa stated: “On the basis of donor commitments and other relevant factors, the **OECD estimates that official development assistance from the G8 and other donors to all developing countries will now increase by around \$50 billion a year by 2010, compared to 2004.**”

G7 contributions to ODA since 2004, including OECD estimates for 2008, are shown in Figure 13. In 2004, the G7 collectively committed US\$ 57.6 billion to ODA and by 2008 this had risen to US\$ 80.8bn, which represents an increase of US\$ 23.2 billion (or 46% towards the attainment of the goal).

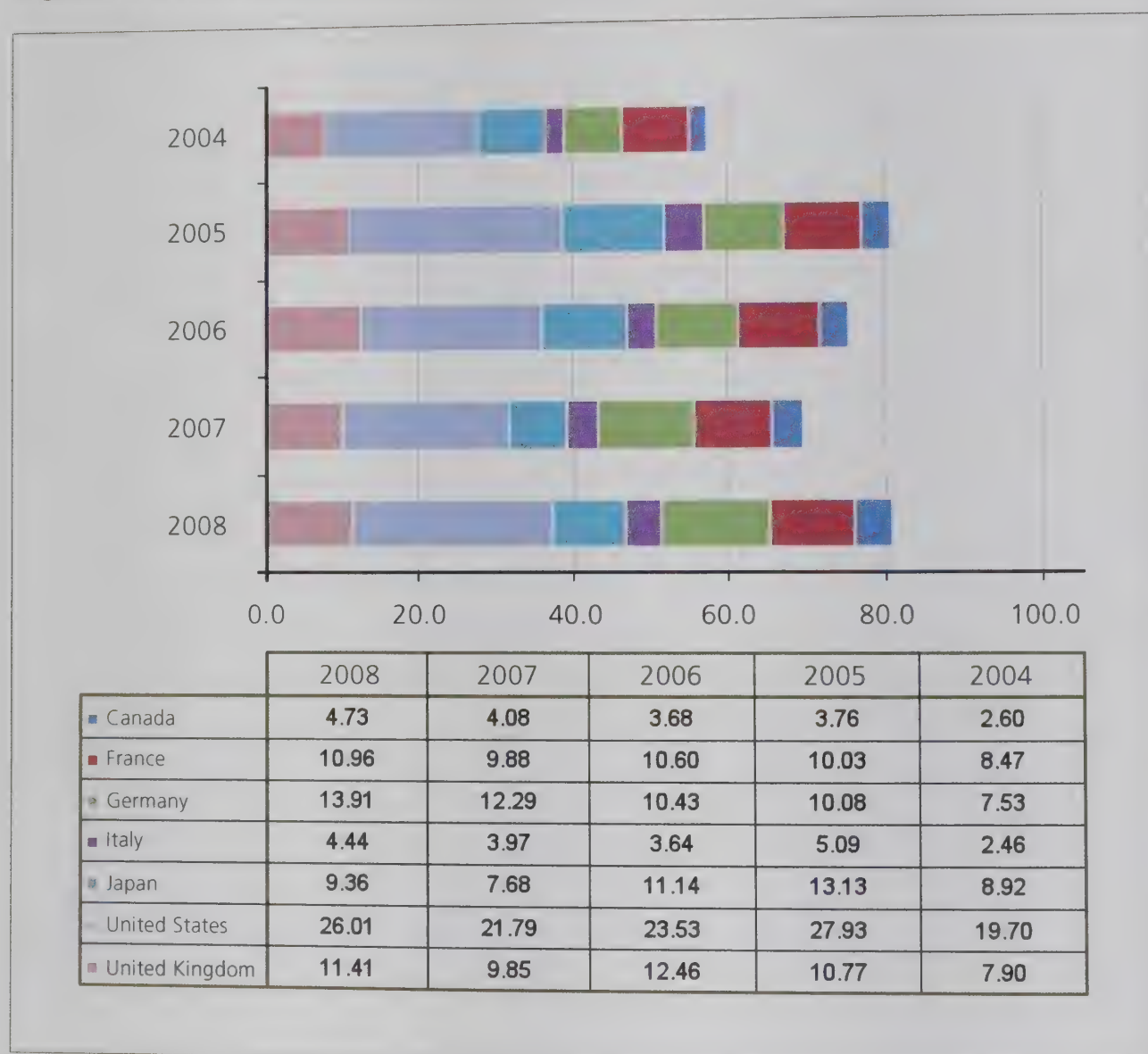
In 2007, total Russian ODA was US\$ 210 million, or 0.02% of GNI. This level reflected an increase from US\$ 100 million in 2006 (One, 2008).

As shown in Figure 10, net ODA to Africa increased substantially from 2004 (US\$ 29.5 billion) to 2006, but a large part of this was due to exceptional debt relief, especially for Nigeria. Excluding debt relief grants, underlying ODA to Africa rose by 12% in real terms from 2004 to 2006. In 2007, net ODA to Africa amounted to US\$ 38.7 billion. The Gleneagles G8 summit estimate that donors’ total commitments would amount to “an increase in ODA to Africa of US\$ 25 billion a year by 2010, more

than doubling aid to Africa compared to 2004” is generally interpreted as meaning an increase in ODA of US\$ 25 billion at 2004 prices and exchange rates. Thus, for the promise to be fulfilled, ODA to Africa would need

to be at least \$54.5 billion in 2010, at 2004 prices and exchange rates. To achieve this target, donors will need to boost their aid to Africa between 2007 and 2010 by over 17% annually (OECD, 2008; One, 2008).

Figure 13 ODA commitments by G7 countries in US\$ billions, 2004–2008



Note: The data for 2008 are preliminary, pending detailed final data to be published in December 2009. The data are standardized on a calendar year basis for all donors, and so may differ from fiscal year data available in countries' budget documents.
Source: OECD, 2009a

Policy implication

To fulfil the Gleneagles commitments for general increases in ODA and for specific ODA increases for Africa, the G7 will need to increase their ODA by about US\$ 30 billion between 2007 and 2010 and total DAC contributions of ODA for Africa will need to rise by over 17% annually in that period.

3 Gap between actual ODA investments in R&D for health and target to invest 5% of health ODA in R&D for health

The Commission on Health Research for Development (1990) recommended that **5% of development assistance to health should be allocated to health research and research capacity strengthening.**

As noted in last year's Report Card, a study by the Kaiser Family Foundation (Kates et al., 2008) published in 2008 showed that ODA to health has been rising steeply during recent years. An important new initiative by the Institute for Health Metrics and Evaluation (IHME) at the University of Washington has now provided detailed documentation of development assistance for health from 1990–2007 and IHME will produce annual reports in future (Ravishankar, 2009; IHME, 2009). Key findings of the IHME study included:

- Development assistance for health (measured in real 2007 US\$) quadrupled from US\$ 5.6 billion in 1990 to US\$ 21.8 billion in 2007, with the most dramatic gains having occurred in the period 2002–2007.

- Contributions from donor governments over the period 1990–2007 averaged nearly two thirds of total development assistance for health flowing to LMICs (lowest 60%, highest 76%).
- The proportion of health aid via bilateral agencies fluctuated considerably, being highest in 1990 (46.8%), lowest in 2001 (27.1%) and rising again to reach 34% in 2007; while overseas health aid from nongovernmental organizations (NGOs) provided a quarter of the total in 2007 (Figure 14)
- Private sources of funding accounted for a growing share of total health assistance, up from 19% in 1998 to 26.7% in 2007.
- Private sector in-kind contributions, in the form of technical assistance and drug donations, constitute a significant share of total health aid, estimated at US\$ 8.7 billion (40%) out of US\$ 21.8 billion in 2007 (although the current methods being used to assign values to those contributions may mean that the figures could be inflated).

Of the US\$ 21.8 billion provided by all development assistance partners in 2007 to support health in LMICs, if 5% of this were allocated to R&D and research capacity strengthening this would amount to US\$ 1.1 billion. More specifically, support to health in LMICs through bilateral channels in 2007 amounted to US\$ 7.4 billion and 5% of this would provide US\$ 370 million of financing for R&D and research capacity strengthening.

The IHME study does not cover the proportion of health assistance from

bilateral sources that is allocated to R&D and comprehensive data on this is not available at present. The Global Forum is initiating work during 2009 to estimate these investments.

Policy implication

- To reach the target, HICs should continue increasing the proportion of health ODA devoted to the broad field

of research for health – including, but not limited to, health R&D and research capacity strengthening.

- Development assistance partners should systematically track and report on the proportions of their health ODA that is allocated to health R&D and research capacity strengthening and should use the information in steering aid towards meeting the 5% target.

4 Low- and middle-income countries

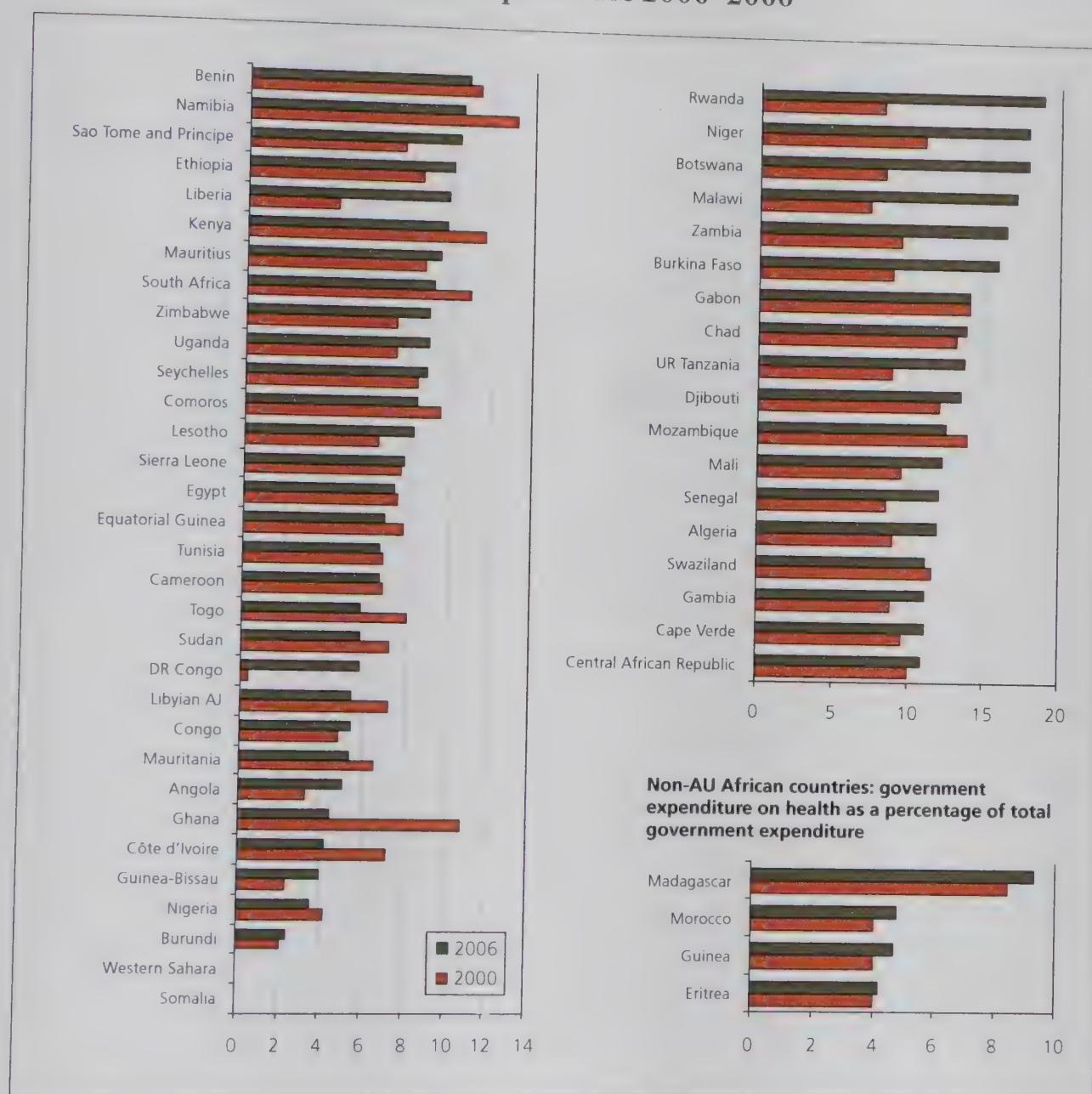
1 Gap between actual investments in health and target to spend 15% of domestic public spending on health

In the 2001 Abuja Declaration, Heads of State and Government of the Organization of African Unity (OAU) pledged “**to set a target of allocating at least 15% of our annual budget to the improvement of the health sector**”. While this 15% commitment only applied to members of the OAU (now called the African Union), it is similar to government spending levels on health seen in HICs and provides a useful benchmark for assessing the levels of health spending by LMICs³ generally.

Africa

African Union: Government expenditure on health as a percentage of total government expenditure in African Union (AU) countries⁵ is illustrated in Figure 15 (WHO, 2009b). By 2006, six members of the AU (Botswana, Burkina Faso, Malawi, Niger, Rwanda and Zambia) had met the commitment made in the 2001 Abuja Declaration and these countries showed among the largest increases in government health spending since 2000. At the other end of the scale, five countries (Burundi, Côte d’Ivoire, Ghana, Guinea-Bissau and Nigeria) were still spending less than 5% of the government budget on health in 2006 (no data was available for Somalia and Western Sahara).

Figure 14 AU and non-AU African government expenditure on health as a percentage of total government expenditure 2000–2006



Source: WHO, 2009b.

Non-AU African countries: Government expenditure on health as a percentage of total government expenditure in the four non-AU African countries is also illustrated in Figure 14. Eritrea, Guinea and Morocco all increased their government health expenditure to above 4% of total government expenditure between 2000 and 2006, while Madagascar increased from 8.4% to 9.3% in this period.

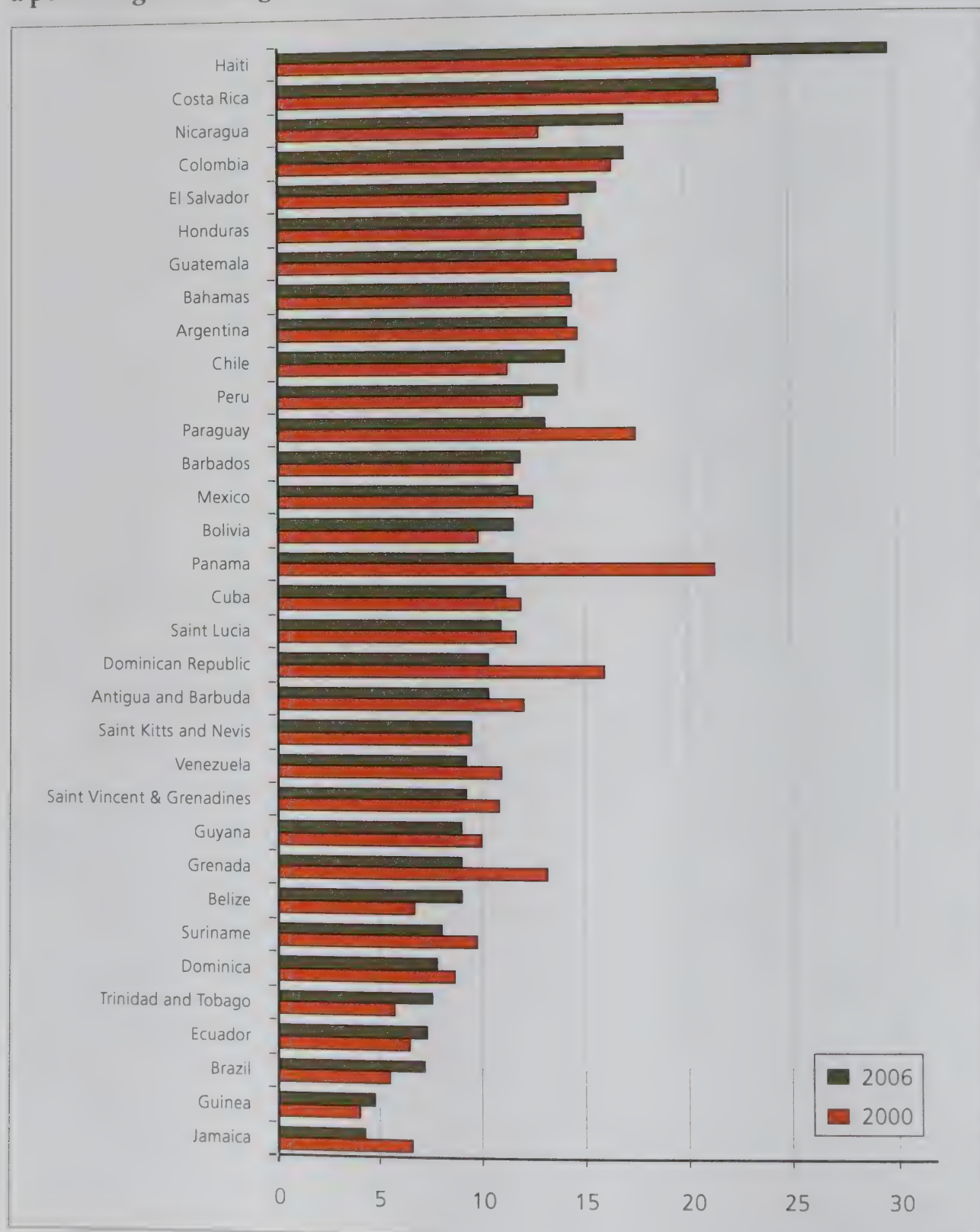
Other regions

In its 2009 statistical report, the World Health Organization (WHO) notes that, in 2006, global expenditure on health was about 8.7% of GDP. This translates to about US\$ 716 per capita on average, but with tremendous variation ranging from US\$ 31 per capita in the South-East Asia region to US\$ 2636 per capita in the Americas. The government share

in health spending varies from 76% in Europe to 34% in South-East Asia, where government expenditure in health is low. The shortfall is made up in low-income countries by private spending, about

85% of which is out-of-pocket, which leads to a high probability of catastrophic payments that can result in poverty for the household. External resources are becoming a major source of health funding

Figure 15 Latin America and Caribbean government expenditure on health as a percentage of total government expenditure 2000–2006



Source: WHO, 2009b.

in low-income countries. From a share of 12% of total health expenditure in 2000, external resources represented 17% of low-income country health expenditure in 2006. Some low-income countries have two thirds of their total health expenditure funded by external resources. In these situations, predictability of aid is an important concern.

Among the Latin American and Caribbean countries, Colombia, Costa Rica, El Salvador, Haiti, Honduras and Nicaragua spent more than 15% of the government budget on health in 2006, with Argentina, Bahamas, Chile and Guatemala coming close with more than 14% expenditure (Figure 15).

In the Asia-Pacific region, LMICs that spent more than 15% of the government budget on health in 2006 were the Federated States of Micronesia, Nauru, Timor-Leste and Tuvalu, which spent a massive 38.1%. These were also among the countries that showed the greatest improvements since 2000. The Marshall Islands, Solomon Islands and Turkmenistan all invested between 14% and 15% of government expenditure in health. Countries with extremely low levels of investment in health (<5% of government expenditure) were India, Iraq, the Lao People's Democratic Republic, Myanmar and Pakistan. Almost a third of the countries in this region showed no increase or an actual decrease in government investment in health in the 2000–2006 period (Figure 16).

Policy implication

- The commitment by AU countries to invest 15% of the government

budget in health was being met in 2006 by Botswana, Burkina Faso, Niger, Malawi, Rwanda and Zambia. Other AU members need to make greater efforts to reach this target – in particular Burundi, Côte d'Ivoire, Nigeria, Ghana and Guinea-Bissau, all of which were still spending less than 5% of the government budget on health in 2006.

- Investment of 15% of the government budget in health is a valuable benchmark of the commitment to health by LMIC governments generally. Outside the AU, in the Latin American and Caribbean region Colombia, Costa Rica, El Salvador, Haiti, Honduras and Nicaragua exceeded this level of health spending in 2006, as did the Federated States of Micronesia, Timor-Leste, Tuvalu and Nauru in the Asia-Pacific region. Countries spending less than 5% of the government budget on health in 2006 included Guinea and Jamaica in the Latin American and Caribbean region and India, Iraq, the Lao People's Democratic Republic, Myanmar and Pakistan in the Asia-Pacific region.

2 Gap between actual investments in R&D for health and target to spend 2% of national health budgets on health research

In its 1990 report, the Commission on Health Research for Development recommended that **LMICs should aim to spend 2% of their government health budgets on health research and research capacity strengthening.** As yet, few LMICs report their investments in health research so only

Figure 16 Asian and Pacific government expenditure on health as a percentage of total government expenditure 2000–2006



Source: WHO, 2009b

a limited picture is available at present and in 2005 no LMIC had attained the 2% target. Figure 17 illustrates the data for two groups of countries:

- Within the **BRICSA group**, according to OECD data, South Africa was making the biggest investment in health R&D as a proportion of health spending in 2005, while Brazil, China, India and the Russian Federation were all investing well below 1%.
- In **Latin America and the Caribbean**, Cuba, Panama and Venezuela were making the largest investments in health R&D as a proportion of health spending in 2005.

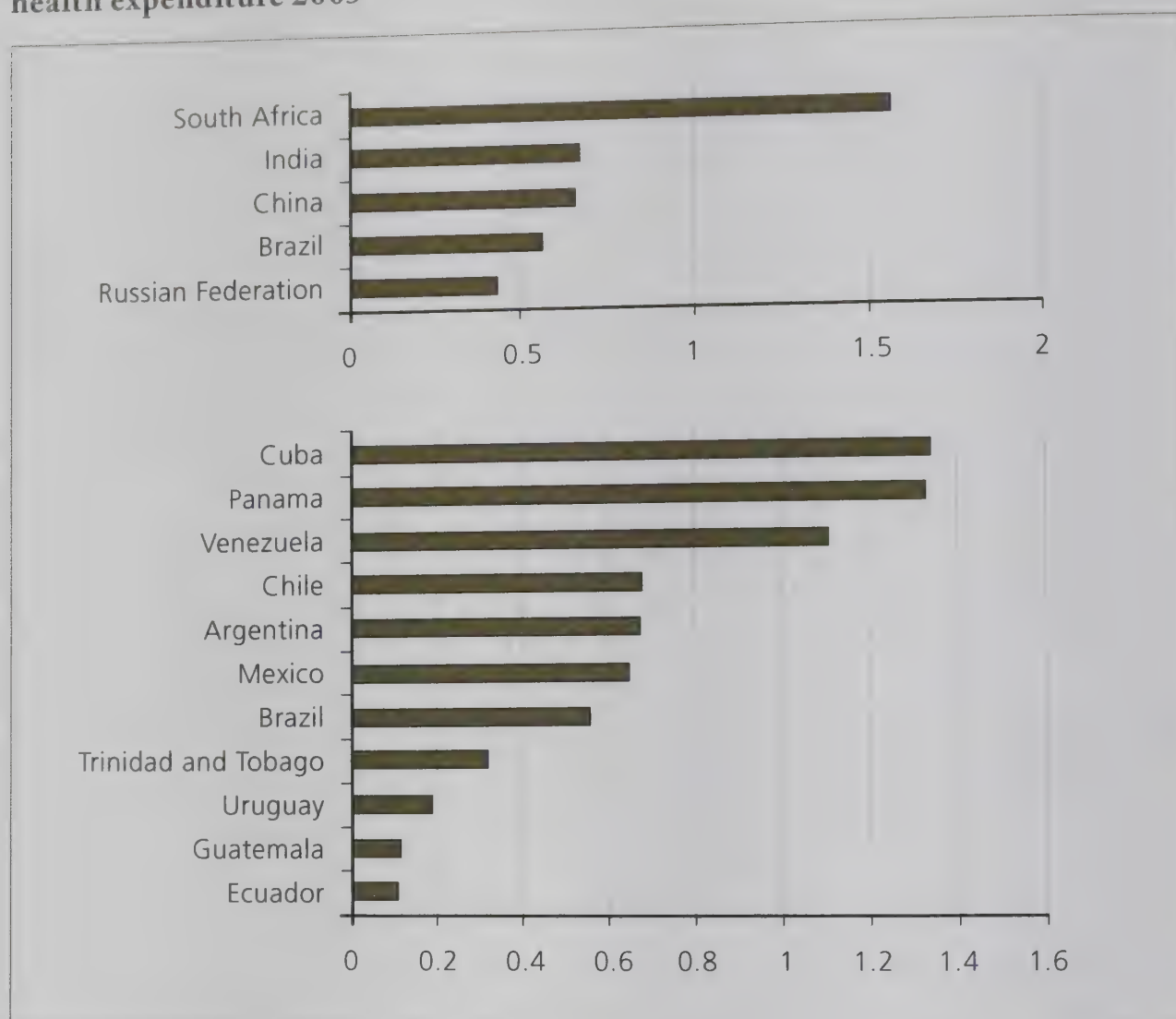
The 2% target has most recently been re-endorsed by the Global Ministerial Forum on Research for Health in Bamako in November 2008. WHO has developed a systematic approach to national health research systems analysis (Sadana & Pang, 2004) and the WHO Regional Office for Africa is undertaking a major programme to survey national health research systems

in the region (WHO-AFRO, 2008), while the new Health Research Web being launched by the Council on Health Research for Development (COHRED, 2009) will accumulate data on country health research systems. It is hoped that these initiatives, together with the efforts that the Global Forum is making to encourage LMICs to adopt regular, systematic resource tracking, will lead to much greater availability of annual and internationally comparable data on expenditures on R&D for health.

Policy implication

- Following recent re-affirmations of the target that LMICs should aim to spend 2% of their government health budgets on health research and research capacity strengthening, all LMICs need to put in place policies and strategies to reach this target.
- For most LMICs there is also a need to institute national systems for tracking and reporting health R&D investments if the commitment to the 2% target is to have any meaning.

Figure 17 Total expenditure on health R&D as a percentage of total national health expenditure 2005



Source: Global Forum, 2008

5 Global health initiatives and development agencies

1 Global health initiatives and development agencies

The general target that **5% of development assistance to health should be allocated to health research and research capacity strengthening** was first recommended in 1990 by the Commission on Health Research for Development. The extent to which bilateral donors are meeting this target is discussed above under element B3.

Since 1990, the role of other actors in global health has increased enormously – in particular, intergovernmental agencies and the private not-for-profit sector. In the 2006 Accra Communiqué, ministers of health and heads of delegation of 14 African countries urged **global health initiatives and development agencies to devote at least 5% of their overall health investment portfolio to support research capacity of countries, dissemination of research findings and management of knowledge.**

A new tracking study by the Institute for Health Metrics and Evaluation (IHME) (2009) demonstrated the greatly increased role of new actors over the last two decades as providers of development assistance to health. For example, from 1990 to 2007 development assistance for health rose from US\$ 5.59 billion to US\$ 21.79 billion. In particular, apart from bilateral development agencies, major health contributions are now being provided by a range of international development agencies and global health initiatives, including development banks, foundations, multilateral organizations and NGOs. This section examines the information currently available about the contributions these actors are making to research.

Development Banks

World Bank: As highlighted in the 2008 Report Card (Global Forum, 2008), the World Bank is not a donor agency but acts almost exclusively as a lender to the economies of LMICs, including to the health sector, through the International Development Association (IDA) and the International Bank for Reconstruction and Development (IBRD).

- The World Bank does not have a formal policy commitment to include a specific research allocation in its lending. However, it does encourage countries to allocate up to an initial 1% of the total operations budget in loans to 'analytical work' (a term commonly used in the Bank to cover research) in support of the programmes funded. Insufficient use is made of this facility by countries. The World Bank announced in February 2009 that it expected

to triple its lending for health programs to US\$ 3 billion this year to mitigate the impact of the global credit crisis in poor countries. If LMICs took full advantage of the opportunity to allocate 1% of these loans to 'analytical work', this could generate US\$ 30 million of funding for country-based research, activities in 2009.

- In the financial year to June 2008, the World Bank's Development Grant Facility (DGF) disbursed US\$ 178.52 million in grants to 55 programmes, of which 10 were in the Bank's Health, Nutrition and Population sector. This health funding amounted to US\$ 21.1 million, of which US\$ 9.4 million (44.5%) was allocated to health R&D.

Regional development banks: The Asian Development Bank (ADB), the African Development Bank (AfDB) and the Inter-American Development Bank (IDB) provide targeted financial and technical assistance to LMICs within their region of focus. The IHME tracking study (2009) has reported that the combined contributions by ADB, AfDB and IDB to the health sector in 2007 amounted to about US\$ 0.4 billion. No information is currently available about the use of any portion of this health funding for research.

Foundations and NGOs

Bill and Melinda Gates Foundation (BMGF): The BMGF committed close to US\$ 2 billion per year in 2006 and 2007 to global health, although actual disbursements were substantially lower according to the IHME study (2009).

Out of about US\$ 1.2 billion dispersed in 2007, one third was allocated to universities, research institutions and product development partnerships for health R&D activities.

Other foundations and NGOs: The USA is by far the largest source of private giving, including to the health sector. Compared with the BMGF, contributions to global health by other US-based foundations are relatively small, collectively amounting to less than US\$ 300 million in 2007. Non-US based NGOs contributed over US\$ 230 million in 2006 (IHME, 2009). As yet, information on the proportion of this global health funding allocated to research is not available.

Multilateral organizations

European Commission (EC): Despite the overall importance of the Europe Union as the world's largest source of development assistance, the EC is a relatively modest contributor to the health sector in LMICs, having accounted for less than US\$ 0.5 billion per year in recent years (IHME, 2009). There is no specific policy regarding allocation of EC health sector support to research.

United Nations agencies: The IHME study (2009) has estimated contributions to development assistance for health in 2007 to be in the region of US\$ 1.7 billion for WHO and US\$ 0.7 billion for the United Nations Children's Fund (UNICEF), with smaller amounts for the United Nations Population Fund (UNFPA) and the Joint United Nations Programme on HIV/AIDS (UNAIDS).

Of these agencies, WHO is the only one with a research mandate built into its constitution, but it does not have an overall policy on the fraction of its funding spent on research centrally or at regional or country levels. However the WHO Regional Office for the Eastern Mediterranean has adopted a 2% target for the proportion of its health sector assistance spent on research.

WHO's regular income has remained relatively constant for the last two decades at around US\$ 0.5 billion per year and represents less than a fifth of the total income, which is mainly derived from extra-budgetary sources. Recent estimates conducted in connection with the development of the first WHO Research Strategy indicate that aggregate spending on research from regular and extra-budgetary sources amounted to US\$ 232 million for the biennium 2006–7, or around 4% per year of the total annual income, mainly in the form of targeted funding for specific research activities such as the co-sponsored special programmes for research in tropical diseases and human reproduction and the International Agency for Research on Cancer (van de Rijt & Terry, 2008). The proportion of the regular budget allocated for research is unclear but is also certainly less than 4%.

Global health initiatives (GHIs):

Two very large global health initiatives account for most of the support to health in LMICs coming from this group of actors:

1) Global Fund to Fight AIDS, Tuberculosis and Malaria (GFATM): GFATM was created in 2002 to support

country programmes to combat AIDS, TB and Malaria, especially focusing on the purchase of drugs. By 2009, GFATM was providing 57% of international resources for tuberculosis control, 50% for the global response to malaria and 23% of international financing for AIDS (GFATM, 2009).

Recently it has begun allocating a portion of its funding to support the development of health systems more broadly. In 2007, it disbursed US\$ 2.5 billion in grants. The Global Fund has encouraged recipient programmes to spend 5–10% of grant budget on monitoring and evaluation, including operational research, but in funding rounds 1–5, only a fifth of proposals included operational research (Korenromp et al., 2007). This has subsequently increased and, over the total Global Fund portfolio to 2008, the budget allocated to operational research increased from 0.4% to 3%.

2) Global Alliance for Vaccines and Immunization (GAVI): The GAVI Alliance has been providing support to the world's poorest countries since 2000 so that they can increase their access to immunisation. GAVI's total programme disbursements reached close to US\$ 900 million in 2007, with US\$ 400 million being allocated to country programmes and the remainder to support to GAVI partners for new initiatives such as

Global Polio Eradication and funding for Pentavalent vaccine procurement (IHME, 2009; GAVI, 2008). In aggregate, by August 2008 GAVI had approved a total of US\$ 3.7 billion to countries for the period 2000 to 2015. The 'Window 3' mechanism introduced in 2002 permits the use of GAVI funds for a range of activities including R&D and GAVI's 2007 revised guidelines for this area stressed the opportunity for countries to use some of their GAVI funds for health systems operational research that better informs decisions and processes for overcoming health systems barriers to deliver immunization (GAVI, 2007).

Policy implication

Global health initiatives and multilateral agencies providing health assistance to LMICs need to:

1. Formally adopt policies of contributing a portion of their health support to research (and research capacity strengthening) and move towards a target of raising this level of research support towards the target of 5% of their health contributions.
2. Regularly track and report on their contributions to research and research capacity strengthening.
3. Encourage countries to take up and fully utilize the provisions available for research, including capacity building.

6 Conclusions

The Report Card on R&D for health tracks financial flows in the domains of development, health and research. All three of these domains contribute to the global financing of R&D for health, including R&D relevant to the health needs of poor and marginalized populations in LMICs. The Report Card examines these financial flows by tracking 10 elements clustered in four groups, comparing actual investments with targets that have been agreed internationally or proposed as benchmarks and indicators of progress.

Since the 2008 Report Card was published, a substantial amount of new data has become available relating to financial flows in the domains of development, health and research (Moran et al. 2009; Ravishankar, 2009; Families USA, 2008). Owing to variations in collecting and reporting cycles, the data available relating to the 10 elements of the Report Card covers the period 2005 to 2008. Year on year, the Report Card therefore provides both a snapshot of the most recent information and a picture of the evolving situation over time. It represents a mechanism by which progress can be assessed and the commitments or aspirations of different actors compared with their actual performance.

The period 2008–2009 has seen enormous challenges being recognized and unprecedented changes taking place in the world. With limited resources to invest in health research, policy-makers need to ensure that research provides both economic and social returns on

investments. To do this, investments needs to be more transparent, so as to draw attention to inequities, provide accountability, and inform health research. Assessments of progress at the mid-point towards the 2015 MDG targets have revealed that the health goals are among the least likely to be attained, especially in sub-Saharan Africa. As the greatest global financial crisis since the 1930s has unfolded, there have been many calls for investments in development generally and health in particular to be sustained and for research to be supported strongly as a vital component of protecting health and ensuring the most efficient use of current and future health resources. A series of massive mergers and acquisitions in the pharmaceutical industry has been accompanied by a growing recognition of the need for new models that will drive innovation generally, and address the health needs of poorer countries.

Against this background, the 2009 Report Card reveals a mixed picture of performance globally in relation to financial flows in the domains contributing to R&D for health:

- Globally, investments in the domains of development, health and research have been rising significantly in recent years, but few countries are meeting the targets that have been set and the pace of increases is often too slow.
- Relatively few countries have instituted policies and strategies for achieving the targets.
- Systems for regularly tracking and reporting on financial flows in the

domains of development, health and research are often weak or non-existent – especially in LMICs but also in some major development partners including bilateral and multilateral development agencies and global health initiatives.

Health is a fundamental human right, but continuing large health disparities between and within populations across the world demonstrate the limited extent to which the protection of this human right has been given priority. Research has vital roles to play in supporting the achievement of health equity, including through identifying the nature, extent and root causes of ill-health, identifying and testing solutions and monitoring and evaluating the effectiveness and impact of interventions. Ignorance – the lack of the knowledge, products and tools that research provides – is truly a fatal disease.

Although the benefits of health research are difficult to quantify, it is evident that it has produced both positive

changes in health and quality of life, while substantially contributing to economic development (Cyril, 2009). Technical progress has contributed to longer life expectancy globally, yet the poorest still have significantly shorter life expectancies than the wealthiest. It is in this context that the Global Forum advocates for greater application of the knowledge, processes and products of research as well as research for the needs of the poor.

Tracking resources for R&D for health provides one important approach to examining the extent of efforts being undertaken to improve health and health equity. The Global Forum for Health Research will continue its efforts to monitor the flows of resources that feed into R&D. It will especially focus attention on the gaps in resources needed to support research to address the priority health needs of the poorest and most disadvantaged people in the world and to ensure that they do not remain the victims of ignorance.

Notes

- 1 Gross domestic expenditure on research and development as a percentage of gross domestic product (GERD): definition (www.un.org/esa/sustdev/natlinfo/indicators/methodology_sheets/econ_development/research_development_expenditure.pdf, accessed 20 August 2009).
- 2 There are 23 members of the DAC: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Italy, Ireland, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom, the United States of America, European Commission. (www.oecd.org/document/32/0,3343,en_2649_33721_42632800_1_1_1_1,00.html#DAC, accessed 20 August 2009).
- 3 The World Bank Country Classification for 2008 lists 43 countries as 'low income' (GNI per capita US\$ 975 or less), 55 'lower middle income' (US\$ 976 to 3855), and 46 'upper middle income' (US\$ 3856 to 11 905). (<http://web.worldbank.org/WBSITE/EXTERNAL/DATASTATISTICS/0,,contentMDK:20420458~menuPK:64133156~pagePK:64133150~piPK:64133175~theSitePK:239419,00.html>, accessed 20 August 2009).
- 4 Data are not available for the following 40 of the 66 HICs: Andorra, Antigua and Barbuda, Aruba, Bahamas, Bahrain, Barbados, Belgium, Bermuda, Brunei Darussalam, Cayman Islands, Channel Islands, Croatia, Cyprus, Estonia, Equatorial Guinea, Faeroe Islands, French Polynesia, Greenland, Guam, Hong Kong, Isle of Man, Israel, Kuwait, Liechtenstein, Macao, Malta, Monaco, Netherlands Antilles, New Caledonia, Northern Mariana Islands, Oman, Puerto Rico, Qatar, San Marino, Saudi Arabia, Singapore, Slovenia, Trinidad and Tobago, United Arab Emirates, Virgin Islands (US).
- 5 The African Union includes all countries on the African continent, except for Eritrea, Guinea, Madagascar and Morocco. Western Sahara is a member of the African Union, although it is only recognised as a territory.

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